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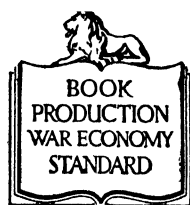








THE FREE WILL  
CONTROVERSY



THE TYPOGRAPHY (AND BINDING)  
OF THIS BOOK CONFORMS TO THE  
AUTHORIZED ECONOMY STANDARD

# THE FREE WILL CONTROVERSY

BY

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## PREFACE

IN a previous work\* the problem of Free Will or Determinism was considered from the points of view of the physicist, the philosopher, and the biologist. Certain conclusions which were attained were based upon the results of research carried out in comparatively recent times by physicists and biologists, though it must be admitted that in many cases the evidence led to issues which were largely inconclusive. The present work has been undertaken by request of the publishers, and it deals with the subject more from the historical than from the scientific point of view. For this reason criticism of certain doctrines has been reduced to a minimum and the main object of the book has always been kept in the foreground—to present the subject in its historical aspect with a summary of the arguments employed by apologists for each side of the controversy. The severe restrictions which have been imposed upon publishers are responsible for limitations in the size of this treatise, and readers cannot expect that anything more than the main facts of the historical side can be included in such small compass.

It must be emphasized from the beginning that this is not a work on ethics, and for this reason controversial questions arising on many moral problems have not been dealt with. If the author has avoided them it is not because he has shirked the issues, but because their consideration would lead far beyond the scope of the work. He is fully alive to the grave problems which confront us to-day—problems which, let it be candidly admitted, have been intensified by recent developments in the world of science, and not least in biology. The words of Rudolf Eucken seem to sum up very appropriately some of the thoughts which inevitably arise in our minds, especially at the present time, when moralists, theologians, and men of science look out on the sorrows of a distraught world for the salvation of which

\* *Free Will or Determinism* (Watts; 1937).

they now stand all equally helpless, visualizing but vaguely the reconstruction of shattered ideals:—

“ Modern science most clearly shows that man belongs to a great world-whole and world-movement; his life and work seem to be completely determined through his relations in this whole; his whole life is subject to an irresistible destiny, and in all his undertakings and conduct he can only follow the course directed by it. This destiny assumes for us the most diverse forms; and through this diversity surrounds us on all sides. Through the power of heredity we enter life with a definite nature; in the family, the State, and the society a particular kind of environment surrounds us and gives to our nature its more detailed colouring; the age meets us with particular tendencies, takes us up into itself with a supreme power, and just as certainly directs us towards certain ends as it diverts us from others.” \*

It is true that he shows how, in spite of the conflict between fate and freedom, life can be unified and made secure and elevated, and spiritual individuality can be formed. Nevertheless we feel that the problem is continuously with us throughout our lives, and we are forced to ask at times : “ Is there no way out ? ” If we are part of the whole system of Nature which is controlled by the principle of natural causation, how can we refute the Determinist who tells us that we are bound to behave in a certain way? Even if we argue that we feel a moral responsibility for our actions, this in itself is insufficient to establish the position of the Indeterminist. Whichever view we accept it seems to present an enigma or to make nonsense of life. The contributions which theology and science have made to the problem have often produced greater complications. The theological difficulty has arisen from the attempt to reconcile two dogmas—that the Creator punishes us for our sins or for the sin of our first parents, and that, being omniscient, He was aware of all that would take place. If God had this knowledge before the event took place, what chance had the human family which has inherited the taints of evil? It has, of course, been argued that

\* *Life's Bases and Life's Ideals*, translated by Alban G. Widgery, pp. 174–5.

God is not subject to the category of time, and hence could not have had the knowledge beforehand, but very few will be prepared to accept such an explanation. Indeed, as will appear later in the work, some theologians accepted the view that each individual has his fate determined for him by the inscrutable decrees of Providence, though they usually succeeded in exonerating the Creator from any responsibility for man's misdeeds. Science has made its contributions too, and here again complications have arisen. The behaviour of the atom has led some to suggest that the universe need not be a closed system and that the physicist has no right to deny freedom of the will. On the other hand, some have found in such behaviour nothing to suggest anything contrary to the usually accepted causal laws, so that the problem remains exactly where it was. In biology the evidence has produced diametrically opposite views on the problem, and when the psychologist has expressed his opinion there is sometimes the suspicion that this opinion is biased by preconceived views or even by early training and impressions on ethical questions.

A synopsis of the views which philosophers, theologians, and men of science have held on the problem during the last 2,500 years will be found in the following chapters. The author is only too well aware of the fact that many lacunae occur in the historical presentation of the subject, and the reasons for this have been already given. Perhaps the book will stimulate some to study more carefully the problem at some of the periods which have been dealt with, for which purpose specialized works must be consulted, if and when such are obtainable.

M. DAVIDSON





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## INTRODUCTION

THE problem of the freedom of the human will still awaits solution, in spite of the fact that philosophers and men of science have offered ostensibly conclusive "proofs" at various periods in the world's history. With developments in different branches of science and with the enormous strides in psychology in recent times the problem still remains—perhaps it would be more correct to say that it has become more complicated. Nearly half a century ago Thomas Huxley in his work, *Hume, with Helps to the Study of Berkeley*, assured us that half the controversies about the freedom of the will would not have existed if a saying quoted from Hume's *Treatise Concerning the Principles of Human Knowledge*, Book IV, p. 111, had been well pondered by opponents of the doctrine of necessity. The words of Hume to which Huxley specially referred are as follows: "By liberty, then, we can only mean a power of acting or not acting according to the determination of the will; that is, if we choose to remain at rest, we may; if we choose to move, we also may." As Huxley remarks, commenting on this passage:—

"Nobody doubts that within certain limits, you can do as you like. But what determines your likings and dislikings? Did you make your own constitution? Is it your contrivance that one thing is pleasant and another is painful? And, even if it were, why did you prefer to make it after the one fashion rather than the other? . . . What they really want to do, if they would upset the necessitarian argument, is to prove that they are free to associate any emotion whatever with any idea whatever; to like pain as much as pleasure; vice as much as virtue—in short, to prove that, whatever may be the fixity of order of the universe of things, that of thought is given over to chance" (pp. 220—1).

Some might consider that this should have settled the question, but it still proves disquieting, and a final solution seems to recede with fresh discoveries. At the commencement of his work, *Scientific Theory and Religion*, Dr. Barnes refers to the co-ordinated discoveries of modern times which have enabled us to build up a coherent plan of the evolution of the universe, even to the development of terrestrial life, including

man. Yet some fundamental problems of philosophy still remain unsolved, such as the nature of time and *human free will*.

A synopsis of the different chapters will assist the reader in following the historical presentation which has been developed in this work. It is perhaps inopportune that the first chapter should deal with Astrology—a subject which will not make a strong appeal to many readers who are only too well aware of the pernicious effects of this superstition, unfortunately resuscitated in recent times. It is impossible, however, to do justice to some of the early Greek systems without a reference to Astrology, which had a profound influence on their development. This is particularly true of Stoicism, which, in spite of its beneficial influence in many ways, was nevertheless vitiated by the astral fatalism of the Chaldeans. This is shown in the second chapter, which deals with Greek philosophy in as far as it includes the problem of the freedom of the will or a deterministic system.

Chapter III is almost entirely theological in its outlook. It shows how the Hebrew conception of the introduction of evil into the world had an important influence in shaping Christian theology under the direction of St. Paul. Questions of predestination, freedom of the will, the depravity of man, etc., emanating from the story of the Fall, divided Christendom into a number of conflicting sects, and Calvinistic theology in all its gloomy and revolting aspects completely distorted man's conceptions of the purpose of creation and of the Creator Himself. These points are considered in Chapter IV.

Leaving theological controversies, the next chapter deals with the philosophy of Descartes, who, while asserting that animals were mere automata, saved the freedom of the will for human beings by means of the pineal gland. It is remarkable that his view regarding the power of the mind to alter the motion of the "animal spirits" is something like Sir Arthur Eddington's argument regarding the effect of the mind upon the brain, about which a few words are said in Chapter XII. In the light of biological evolution it is very difficult to-day to draw any clear line of demarcation between human beings and other forms of life, in a discussion of the problem of free will.

Spinoza's system is the subject for consideration in Chapter VI. Unfortunately his philosophy has been very much misunderstood, and he has been quoted as a supporter of views almost diametrically opposed. It has been shown that his one real thing, God, Substance, or Nature, based upon spiritualistic monism, has something in common with Christian theology, though he claimed that science was able to explain all physical

events, even the actions of the human body, in physical terms. Although he held that in the mind there is no absolute or free will, yet he did not consider that we need feel ourselves robbed of anything valuable, because the supposed consciousness of freedom was merely due to the imperfection of our knowledge. In proportion as we see in all that we are and suffer a consequence of the unchangeable nature of the universe, or of God, we are delivered from the bondage of vain hopes and fears. True peace and freedom are to be found in "the intellectual love of God," in which there is no question of reciprocation; God's knowledge and enjoyment, in strict accordance with Spinoza's system of one Substance, can be nothing more than knowledge and enjoyment of His own nature.

Leibnitz's philosophical system is dealt with very briefly in Chapter VII. Leibnitz turned his attention to the nature of individuality, which he could not find in Spinoza's system. Although his "monads" were not considered to possess any purpose—the only purpose in the universe being that which is displayed by God—yet true freedom was to be obtained by an insight into things as they exist for God. He held that the end determining the will is pleasure, which, however, has nothing in common with egoistic hedonism, but is a sense of increase of perfection. When the will is guided by reason it will sacrifice the transitory pleasure and pursue the constant pleasures which are true happiness.

The system of David Hume is the next subject of inquiry in Chapter VIII. It is shown that modern science necessarily rejects his view that causation is nothing more than mere belief or expectation. One result of his doctrine is that just as there are various degrees of strength in expectation, so too there are different degrees in causation. Dr. Karl Pearson, adopting the fundamental empiricist position, finds that he is forced to give to causation a meaning entirely different from that of Hume. He says: "That a certain sequence has recurred and recurred in the past is a matter of experience to which we give expression in the concept *causation*; that it will continue to recur in the future is a matter of belief to which we give expression in the concept *probability*." \* Hume identifies causation with an expectation of the future, but Pearson restricts it to the past. Hume's views on freedom are very interesting, but they must be read in connection with his fundamental position regarding causation. At the end of Chapter VIII there is a short reference to the work of Anthony Collins, who had anticipated Hume in certain respects in his defence of Necessitarianism, to Jonathan Edwards, and to Bishop Butler.

\* *Grammar of Science*, p. 136.

Chapter IX contains a summary of Kant's philosophy, or rather of those portions of it which deal with the question of the freedom of the will. It may seem almost an impossible task to attempt a synopsis of his views in a single chapter, and it is hoped that the reader will not derive a false conception of his doctrine. No criticism is offered except in the case of his Categorical Imperative, but reference is made to certain works which offer a destructive criticism of his system, and those who are sufficiently interested can read these for themselves.

The views of John Stuart Mill are given in Chapter X. His doctrine that causation is the invariable sequence between phenomena, and that the causes with which he is concerned are not *efficient*, but *physical* causes, is briefly examined at the end of the chapter. The reader will find little difficulty in discovering from the short criticism the fundamental weakness in pure empiricism. It was considered advisable, however, to include his views in this work; they are the last philosophical doctrines bearing on the subject of free will with which the book deals.

The Monism of Haeckel is considered in Chapter XI. His view on the subject of free will—a natural outcome of his materialism—is that it is an illusion. Haeckel seems to have misunderstood Kant's philosophy, judging from his exposition of Kant's doctrine of free will, but it is shown, irrespective of this misunderstanding, that Haeckel could not have been a thorough materialist and that he has allowed himself to fall into a dualistic system in some of his explanations.

Chapter XII deals with the problem as affected by developments in physics, and the biological controversy is briefly summarized in Chapter XIII, but it has been possible to touch only on the fringe of the problem in this sphere. As this will probably prove the most interesting portion of the work to many readers, it is recommended that they should consult some of the books of reference on biology, a list of which appears at the end of the chapter. It is possible that the last word on this problem of free will will be spoken some day by the biologist, though that day may still be a long way off.

How far have developments in the realm of physics and biology affected the problem? A fierce controversy has raged around this question, and the end is not yet in sight. One of the most remarkable things is that views which are antithetical should be held by experts who have given a considerable amount of time to the consideration of the problem, and it is conceivable that future developments in both physics and biology will not reconcile these diverse views. Perhaps there is something in one's mental or spiritual outlook which acts as

the deciding factor in the attitude adopted. If so, we can never expect complete agreement, and so the problem which has perplexed men for thousands of years will still prove intractable. It is certain, however, that the influence of theology on either side is a waning force, and in time it may completely cease to be a factor in the controversy. This applies not only to Christian theology but to other systems too. As is well known, the subject of predestination has produced endless controversies in Islam. The orthodox view is that good and evil take place by the predestination and predetermination of God, and that He may have wise ends in sight which we cannot comprehend, and hence it is unnecessary to ask why He wills and produces evil. Some Mohammedan teachers have endeavoured to maintain the consistency of this doctrine with human freedom and responsibility, but the orthodox or Sunnite Mohammedans believe that man is constrained to act in a certain way by the decrees of God. The freethinking reaction, to which the Shiah's incline, has tended to establish free will at the expense of the sovereignty of God.

How can Christian theology confront the problem? When Christianity arose it was an age of decay, an age which was weary of life, and it cheerfully took up the conflict and implanted a new vitality into an exhausted humanity. Now the onward march of modern science has made a large number of the old conceptions usually associated with Christianity less able to assert themselves. Many of the things which to Christianity were the highest in life have been revalued and are now regarded with indifference. Conceptions such as freedom of the will and moral judgment are but childish delusions, and as life displays its true fundamental character they are treated as irrelevant for the realization of its highest ambitions. The energies of mankind are attracted more and more by the mode of life which has developed in the environment of such convictions. Where will it end? Aware of his limitations on all sides, man sees himself as a mere product of heredity and environment, deprived of all spontaneity, or of power of making his own decisions, his freedom but an illusion. In the grip of a system that seems a soulless mechanism which fails to rouse enthusiasm or to produce the spirit of sacrifice, the minds of some may recoil like the Stoics of old from a pessimism which clouded the thought of the ancient pagan world. Or perhaps others will remain unmoved and indifferent. Wearied of the effort to find the solution to the enigmas and perplexities of life, they may be able to endure

“The slings and arrows of outrageous fortune,”



even if such an endurance is accompanied by the Epicurean pessimism of Omar Khayyám :—

“ 'Tis all a chequer-board of nights and days  
Where destiny with men for pieces plays :  
Hither and thither moves, and mates, and slays,  
And one by one back in the closet lays.”

To such speculations posterity may provide an answer.

## CHAPTER I

### BABYLONIAN ASTROLOGY

ASTROLOGY may not appear to have any connection with the subject discussed in the present work. It must be remembered, however, that astrology had an important influence on Greek and Roman thought during a certain period, and it will be necessary to consider this influence at a later stage. Among ancient races the Babylonians were prominent for bringing magic into a pseudo-scientific state, and in divinatory magic they had elaborated a large number of codes, many of which have been preserved. Omens were drawn from various prodigies, and three methods of divination which were practised by the King of Babylon are mentioned by Ezekiel (xxi, 21): “. . . he shook the arrows to and fro, he consulted the teraphim, he looked in the liver.” Didorus Siculus, the Greek historian, mentions the hereditary skill of the Chaldean priests in various branches of magic, and stresses especially their skill in astrology. Although the Greeks used oracles, dreams, entrails of victims, flight of birds, etc., they were indebted to the Babylonians for astrology, which was introduced after the time of Alexander. Cicero assigns a great antiquity to the astrology of the Babylonians, making it go back 272,000 years! It is certain that astrologers had a very important influence on public affairs. In the Book of Daniel \* the Chaldeans appear as soothsayers and are coupled with magicians, exorcists, and interpreters of signs. We learn from Arrian that the Chaldeans warned Alexander not to enter Babylon, and their authority for the warning was based on an oracle which they had received from their god Belus. Didorus, however, states that the prediction which the Chaldean deputation communicated to Alexander was derived from their astrological science.

The Chaldean astrology was based upon the theory that a star or a constellation presided over the birth of each individual, portending his or her fate and also shedding a benign or a malign influence on his future life. This heavenly guardian was one of the five planets—Mercury, Venus, Mars, Jupiter, and Saturn—or was one of the signs of the zodiac, and it does

\* The events recorded in this Book refer to a period about 600 B.C. The Book was probably written during the persecution of Antiochus Epiphanes, 168 or 167 B.C.

not appear that the stars exercised any influence in the scheme except so far as they composed the signs of the zodiac. The star which looked down upon a child at the time of birth was called the *horoscopus*, and the Chaldean astrologers were called the *genethliaci*, as divination was always founded upon a birth. The idea of divination from birth was transferred to communities also, so that the fortunes of a city could be foretold from its natal day. Even the nativity of the world was brought within the sphere of astrology, and it was believed that the sign Aries was on the meridian at the time of the birth of our planet.

It might be regarded as practically certain that a belief in astrology, which implied a fate from which there was no escape, would paralyse man's effort either individually or collectively to improve the conditions of life or to ameliorate the ills and sufferings which the human family is fated to endure. Such a view, while *a priori* very probable, finds no support in the history of the Babylonians, who provide an illustration of the fact that people are capable of holding various beliefs which are often antithetical, or which, in any case, may exercise little influence on the practical affairs of life. Babylonian theology very largely limited the doctrine of rewards and punishments to this life, and, unlike the Egyptian, who lived for the next world, the Babylonian lived for this world. In this life he was punished for his sins or rewarded for his piety, and beyond the grave there was no Osirian paradise of the Egyptians to receive him with its sunshine and happy meadows. From the Twelfth and last Epic of Gilgames we gather that the world beyond the grave was a place of unspeakable dreariness—a land of darkness where all things were forgotten and where even its denizens were forgotten of men. In some respects it resembled the Hebrew Sheol, the description of which, given in the Book of Job, x, 21–2, indicates the indebtedness of the Hebrews to the Babylonians for some of their religious beliefs. In the gloom of that underworld the ghosts of the dead fed on dust and refuse. There hideous monsters of chaos dimly showed themselves while the kings of the nations sat on their shadowy thrones welcoming the slaughtered king of Babylon with the words, “Art thou also become weak as we? Art thou become like unto us?” \*

\* Isaiah xiv, 10. Isaiah received the prophetic call about 740 B.C. The situation presupposed in this chapter is not that of Isaiah's age, and Driver believes that the “prophecy” referred to must be attributed to an author living towards the close of the Babylonian Exile, about two hundred years after Isaiah's time. The writer displays a remarkable familiarity with the social conditions of the countries with which he deals in this and the preceding chapter. The fall of the Babylonian monarch is depicted with wonderful beauty of imagery and also with a certain

It would serve no useful purpose to deal at length with the meticulous attention which the Babylonians paid to their domestic and civic responsibilities, in spite of the fact that no reward awaited them in the other world. It will be sufficient to mention the code of Hammurabi, which makes detailed provision for every contingency that might arise in life. It is scarcely necessary to remark that this code forms the basis of much of the Hebrew legislation recorded in some of their early sacred books.

Vitruvius informs us that the introduction of astrology into Greece was due to Berosus, who settled in the island of Cos and opened a school there. Berosus was a Chaldean priest who lived in the time of Alexander the Great (356-323 B.C.). It is possible that Berosus was induced to take up his abode at Cos because a medical school was attached to the temple of Æsculapius there, the seminary of physical science attracting him, although he removed to Athens later. His fame as an astronomer whose predictions were fulfilled in such a remarkable way was so great that the Athenians erected a statue to him, and probably his fame as an astronomer had some influence in inducing the Greeks to accept astrological teaching. From the scant information which we have regarding his astronomical attainments it must be assumed that his astronomical knowledge was extremely meagre and crude. As an instance we may refer to his teaching that the moon is a sphere, half of which is igneous, and that a lunar eclipse is due to the non-ignited portion being turned towards the earth.

The birth of Greek astrology can be placed somewhere about 280 B.C., and its diffusion both in Greece and Italy was favoured by a number of causes. First of all, the Greeks had studied meteorology and had associated certain states of the weather with the appearance or disappearance of certain stars or constellations. There was nothing occult about this, and in a sense it could be called scientific; even in our own very uncertain climate it is possible to see some connection between the state of the weather and the rising of certain constellations at different periods of the night. Thus, when the constellation of Orion is visible in our islands we usually associate it with more or less cold weather. Unfortunately among the Greeks this connection between stars and the weather degenerated into the superstitious view that there was an occult association, and the star was converted into the cause. Even Pliny was convinced that the stars influenced the weather, and meteorology

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amount of irony, and the writer was obviously very conversant with the views of the Babylonians on the future life. It is quite irrelevant for our purpose who the author was.

logical fallacies are also found in the works of Aristotle. Obviously astro-meteorology would assist the spread of Chaldean astrology, but other factors were effective in the process. It was an article of religious faith among both Greeks and Romans that there was an affinity between the souls of men and the stars, and that the souls of very eminent people were converted into stars. In addition, the Greeks had a belief in the existence of a genius which took charge of a person at birth, and this genius had some connection with the star which presided over the birth. Lastly, as pointed out by Juvenal, the cessation of the native oracles, and, in consequence, the demand for a substitute, contributed to the spread of astrology.

Two important principles *inter alia* were accepted as fundamental in the system of astrology, and the consequences of these will be so obvious that it will be unnecessary to elaborate their significance in philosophical or ethical systems: (1) The combined action of the stars produces different opportunities at any moment, and these can be utilized in proportion to the measure in which they present themselves; (2) this action is such at the moment of birth that it fixes irrevocably man's destiny, which remains henceforth independent or almost independent of subsequent events.

## CHAPTER II

### THE PROBLEM IN GREEK AND ROMAN PHILOSOPHY

IN the Homeric poems the power of Zeus is displayed as a capricious and irritable will, or else as a Fate which opposed and disappointed men's inclinations to be just. In Hesiod it has reached a higher standard, and is the decree of a conscience which judges impartially in accordance with certain rules. Those who have transgressed are punished, as are those who have slavishly made themselves accomplices of the crime. In the *Iliad* and *Odyssey* anthropomorphism has attained its zenith, and we find that Olympus is inhabited by men and women of a supernatural nature. The gods fall short of the ordinary human beings in morality, and the immortality which is offered can scarcely be described as attractive or even desirable. The presence of Fate stands forth more or less definitely outlined, and the consciousness of mortality and of man's impotence darkens much of the early Greek reflection on human life. The tragedians show us the utter helplessness of man in his struggle against fate. Sometimes fate is identified with the Nemesis which pursues guilt, whether it be hereditary or individual; sometimes the predestined and inevitable transgression and the punishment which follows educate the character. But the main idea is that man cannot escape his destiny and if God means to destroy a man He presents evil to him as good. Only to gods in heaven comes no old age, but even the gods cannot save men from death. As the death of princes was associated with the downfall of States, the latter are under the inflexible decrees of destiny which the gods can postpone but are powerless to avert ultimately. That the pronouncements of the poets were taken seriously is due to the fact that in Greece the poets took the place of the prophets and were the religious as well as the ethical authorities. The poet was often called to account because of his moral sentiments. It would scarcely be correct to say that the poet was entirely responsible for setting the moral standards; probably he often cast into a perfect form the substance of sentiments which had been handed down from tradition. For this reason we must not minimize the seriousness of the influence of Greek literature beginning with Homer. It is true that there was much in it which was offensive to poets and also to philosophers, and they endeavoured to

expurgate such unpleasant elements. It is difficult for us to-day to imagine how any cultured Greeks could take the Homeric gods seriously, but history affords numerous illustrations of the fact that men are to be found who rise above the current conception of the morals of the gods. From the sixth century B.C. there is a decided drift towards monotheism, and Zeus becomes less anthropomorphic, at the same time tending to assume supreme power. When the universe is ruled by a superior will against which others are impotent it is a simple process to merge Destiny in this will, which is regarded as interested in mundane affairs and of a benevolent nature. As will appear later, the Stoics identified Destiny with Providence, and so could trust the government of the universe to justify its ways to men. There is another way in which man is aware that his destiny is shaped for him without his own consent and without his power to intervene. The Greeks believed in a genius attending a man from his birth, as pointed out in the previous chapter. Not only did this genius guide his destiny; it was also believed that a hereditary genius could guide the destiny of a family, this genius carrying taints of crime from generation to generation. In their mythology Ate was the personification of criminal folly (*Iliad*, xix, 91), and she had misled even Zeus to take a hasty oath when Heracles was born. For her offence she was cast out of Olympus, and did not return, but fell, it was said, on the hill where Troy was built. She always remained a mere allegory, never assuming the individuality of a goddess, but is described in the *Iliad* as a swift-footed being who leads people into crimes. The word was used to denote the state of a person who is dominated by some irresistible motive urging him on to destruction. Those who occupied higher stations in life were supposed to be specially afflicted because their prosperity lifted them near that felicity which is the prerogative of the gods, who then display their justifiable anger against them. Herodotus and Æschylus see the judgment of the gods on the eastern despots who attempted to destroy the freedom of the Greek cities in the Persian wars.

Enough has been said about the poets and historians, and certain philosophic movements will now be considered. In the science of nature the starting-point is far removed from the anthropomorphism of Homer. Xenophanes, the reputed founder of the Eleatic school of philosophy, who was born in the third or fourth decade of the sixth century B.C., scoffs at the anthropomorphic and anthropopathic polytheism of his contemporaries. He pours contempt on the belief that gods have senses, voices, and bodies like men, and reproaches Homer

and Hesiod with attributing to the gods things that are a shame among men, such as deceit, theft, and other lawless acts. Even if we regard Xenophanes as a pantheist and merely asserting the unity of Being, it is obvious that in his days it was quite a safe procedure to attack the Homeric pantheon.

It is generally recognized that Thales of Miletus (640–546 B.C.) was the founder of Greek geometry, astronomy, and philosophy. The problem upon which Thales and the philosophers of Miletus concentrated their attention was that of change. The world presented a spectacle of perpetual transformation, but what was this one thing which took so many shapes? Thales said it was water; Anaximander thought that it was not only water but also its opposite—fire; Anaximenes identified the primitive substance with air, or rather with mist or vapour. The Milesian school came to an end in 494 B.C., when the Persians destroyed Miletus. As the present work is limited to such philosophical tenets as have a direct bearing on the subject of freedom of will or determination, it is unnecessary to consider all the systems which arose in Greece from the sixth century B.C. The teaching of Democritus, one of the founders of the Atomic philosophy, will now be dealt with.

Democritus was a contemporary of Socrates, but the exact date of his birth is uncertain; it has been fixed on various years from 494 to 460 B.C. Of all the materialistic explanations of the universe put forth by the Greeks, that of Democritus has held the primary place in philosophical thought. Atoms, according to Democritus, are the ultimate material of all things, even including spirit, and have existed from all eternity. Although they are invisible, they are extended, heavy, and also impenetrable, and vary in shape. Atoms are in continuous motion, which, like the atoms themselves, is eternal. The world and all that it contains were produced by the motion of the atoms, and it is thought by some that Democritus taught that there is an innate necessity by which similar atoms come together. Soul and fire were held to be of one nature, and the atoms composing them were small and smooth. Life was maintained by inhaling and exhaling these atoms, and it followed that the soul perished with the body. The system denied that the creation of the world was due to reason, and there is no doubt that Aristotle's condemnation of this part of the teaching of Democritus was a great hindrance to the progress of natural science. Atomism seemed to Aristotle condemned because it failed to take the teleological point of view—that is, to find the explanation of natural phenomena in a tendency for everything to realize its best and most perfect state. The real founder of Atomism was Leucippus, but his work has been



thrown into the background beside the greater fame of his pupil, Democritus, who was responsible for the development of the Atomic philosophy. It is unnecessary to deal with the earlier work of Leucippus, and we shall now consider the influence of Democritus on the Epicureans.

Epicurus (342–270 B.C.) based his physics on the teaching of Democritus, and his main object was the abolition of the dualism between mind and matter. Atoms and the void are his fundamental postulates, and the atoms in their perpetual motions are always giving rise to new worlds which, in their turn, are perpetually tending towards dissolution and towards a fresh series of creations. Divine intervention is eliminated, and the gods, the existence of whom is not denied, have no responsibility for upholding or directing the world. Like Democritus, Epicurus objects to the doctrine of mythology and he also objects to the doctrine of an inevitable fate—that is, a necessary order of things which remains unchangeable and supreme above human will. “Better to accept all the legends of the gods than to make ourselves slaves to the fate of the natural philosophers.” Fatalism seemed to Epicurus as deadly to man’s true welfare as the popular superstition. It is remarkable that this view should be held by one who accepted Atomism, but in the movements of the atoms Epicurus introduced a sudden change in direction, so that their aggregation was rendered easier, and in this way the law of destiny was broken. He would not allow of an absolutely controlling necessity in the sphere of human action, though he admitted that in our circumstances there was much that sprang from mere chance. Independence of the gods and of fatality forms an essential part of the Epicurean teaching, and it was a principle of the system that pleasure is the chief good, at which alone it is reasonable to aim, for which reason the name of Epicurean became a synonym for sensualist. It is a mistake, however, to regard either Epicurus or his chief followers as sensualists, and indeed there is nothing to show that they recommended, either by precept or example, self-indulgence as the best means of attaining their goal. A discussion of the ethical side of the system is outside the province of the present volume, but it may be remarked that the work of Lucretius (96–55 B.C.) is a proof, if such is needed, that Epicureanism is quite consistent with great nobility of soul, though it taught that the death of the body was the end of everything for man, and hence the other world held out neither hopes nor terrors.

The Epicurean school was confronted by another, founded at the end of the fourth century B.C. by Zeno. It took its name, not from that of its founder, but from the *Stoa* or porch in

Athens where he taught. The Stoics opposed the Epicurean doctrine that pleasure was the chief good and taught that virtue was the *summum bonum*. For centuries the two schools attracted adherents, between whom endless disputations were always occurring. When St. Paul visited Athens he encountered representatives of both schools (Acts xvii, 18), and from the description given in verse 21 we infer that all the leisure time there was spent in expounding new doctrines or in listening to them. The Stoics discerned divine providence everywhere ruling and upholding the world. This providence or immutable destiny had assigned a place to each one, and the acceptance of this with a devout and cheerful mind was the real secret of happiness and serenity. The world as a developed whole was looked upon as an organism permeated with the divine Spirit, and in a sense the world process might be regarded as a self-realization of the divine Being. Although the Stoics claimed the citizenship of the world, this did not prevent them from acknowledging the narrower citizenship. The former claim was based upon the conviction that the universe contained a wonderful and beautiful order, and those who could discern this could show their devotion just as the patriots could to their native city. It is not surprising that Stoicism found a ready response in Rome. The view that the world was a commonwealth in which private interests must be subordinated to the public weal was congenial to Roman tradition. This conception of the solidarity of the universe, fundamental in the system, contained much akin to the astral fatalism of the Chaldeans, and, while Stoicism contributed something to Man's political advancement, it could not continue for long to be an instrument of progress. It encouraged divination; it taught that there was an inner harmony in the universe if mankind could only perceive it, and by doing so it turned men's efforts away from the struggle with Nature; it merely asked for adaptation to external circumstances, and made no demand for the change of circumstances, and its highest fruit was resignation. It seems surprising that the Stoics championed religion against the Epicureans, who maintained that the will was free, but a moment's reflection will show how this apparent anomaly is explicable. With the Stoics the immutable order of Nature was identified with divine Providence, and sometimes the most deeply religious minds are filled with the thought of their helplessness and impotence to work out their own salvation. All the good which they possess they ascribe to the grace of God—a statement which requires no elaboration for those who are conversant with the theological outlook of many sects in Christendom. Stoicism fell more rapidly than any of the other

ancient systems, and its influence after the days of Marcus Aurelius Antoninus was small. If it is true, as some believe, that his *Meditations* were intended for the guidance in life of his son Commodus, they failed in their object. Commodus was one of the greatest sensualists and tyrants that ever disgraced the Roman purple. The writings of the later Stoics—Seneca, Cornutus, Persius, Lucan, and Marcus Aurelius—show that philosophy was largely restricted to the practical side, and submission to Providence and universal philanthropy became outstanding features. With Seneca this submission took the form of meditation upon death, and he endeavoured to reconcile himself to the idea of suicide. Probably Epictetus stands out most conspicuously among Stoics for the beauty of his character, which rose superior to the slave's estate, physical defect (it is uncertain whether his lameness was due to the cruelty of his master or to accident or was congenital), and to a delicate constitution. His philosophy is stamped with a very practical character, and he was a stern preacher of righteousness. To him the main problem of life is how it is to be lived well, and all other inquiries sink into insignificance beside this. One thing is fully our own—our will—and even God who has given it to us has no power to control it. Nothing can force us to act against our will, and if we are overcome in the conflict it is because we have willed to be conquered. Although Epictetus thus allowed men their wills, he denied that they were responsible for the ideas which presented themselves to their consciousness, but when the ideas were presented, absolute responsibility for the manner in which they were used was entailed.

Before the appearance of the Stoics, Plato had taught that no one was wicked of his own free will. A man becomes wicked for various reasons—from a bad condition of the body or through defective education or a bad political system, though he cannot on this account claim exemption from the charge of guiltiness. In particular, he has no right to make a claim for exoneration if his action proceeds from evil intention. In *The Nicomachean Ethics* Aristotle lays it down that virtue and vice are both voluntary, for, if it is in our power to act, it is in our power to refrain from acting, and vice versa. If it is in our power to act when action is noble, it will be in our power to refrain when action is shameful. This is the justification for the rewards attached to good and the punishments inflicted for evil deeds. If ignorance is due to vice or negligence it is punishable. An unjust or licentious person had it once in his power not to become such, and for this reason he is voluntarily unjust or licentious. We censure people who are ugly when the ugliness arises from negligence and want of exercise, and

the same applies to bodily infirmities—e.g., when blindness is due to intemperance or licentiousness. In the same way we censure those who are voluntarily wicked. Aristotle saw a danger in the doctrine that vice is involuntary, which seemed to be a natural inference from the Socratic identification of knowledge with virtue, and he attempted to refute this view.

Probably sufficient has been said on the point of view of the Greek philosophers, and we shall now proceed to deal with the problem as it presented itself to a race which was utterly lacking in the scientific spirit, but whose contribution to mankind consisted largely in its moral and religious thought and teaching. Defective and crude as it was in many respects, it has exercised a beneficial influence on the whole, though much of the teaching has been superseded and probably more of it will be superseded in the generations yet to come.

### CHAPTER III

## THE HEBREW CONCEPTION OF THE ORIGIN OF EVIL, AND ITS IMPACT ON CHRISTIAN THEOLOGY

THE question of free will or determinism in Judaism and Christianity is closely associated with the problems of predestination and of the origin of evil in the world. For this reason it will be necessary to digress from the main thesis to consider the chief explanations which have been offered to account for sin and how it first appeared. There is an enormous amount of literature which deals with this subject, and in the present chapter it will be possible only to give a mere outline, which, it is hoped, will suffice as a basis for a proper understanding of certain ramifications in Christian theology. It is generally believed that the only explanation which the Hebrew sacred books afford of the origin of evil is that which is given in Genesis iii, where the temptation by the devil of Adam and Eve is held responsible for the Fall. Before this legend was accepted, however, there was another story of an unsavoury nature, narrated in Genesis vi, 1-7, in which we are informed that fallen angels—"the sons of God"—married the daughters of men and as a result of this union a race of giants (the Nephilim) appeared who filled the earth with violence. These fallen angels are referred to in various parts of the Canonical Books as well as the Apocrypha, and are known as "the watchers." In the Book of Daniel they are frequently mentioned; see, for instance, chapter iv. In the Book of Enoch, vi, 6, we are told that these apostate angels, 200 in number, descended to Mount Hermon. The arrogant giants were supposed to have inherited a certain amount of the divine nature and, according to Genesis vi, Yahweh decided at first to impose a limit upon their lives—120 years—by which means the divine nature would be more rapidly eliminated than if they attained the years attributed to descendants of Adam, as recorded in chapter v. The probable meaning of vi, 3 is, "My spirit shall not abide in man for ever, for in his going astray he also is flesh; therefore shall his days be an hundred and twenty years." As the elimination of the divine, either through fear of the ultimate power of the Nephilim or through jealousy, was going to be a slow process, Yahweh next decided on a speedier method by which they would be destroyed, and there

follows the account of the Deluge. In verse 5 we read of Yahweh's opinion about man—that "every imagination of the thoughts of his heart was only evil continually," from which it may be assumed that this evil imagination was regarded as a sinful habit which is impressed on the soul by the repetition of wrong actions. In viii, 21 we read: ". . . the imagination of man's heart is evil from his youth," and this seems to imply a form which the Creator has already implanted. The evil imagination—the *yēçer-ha-ra'*—was believed by the Rabbis to be implanted *de novo* in the soul of every individual at birth, and hence no one inherits a tendency to sin from his parents nor does he transmit such a tendency to his children. The *yēçer* was not implanted to make people sin, but it was considered to be a necessary pre-condition of moral virtue. At the beginning of the Christian era there were these three theories to account for the origin of sin: (1) the legend of the apostate angels, which, however, presented certain difficulties, one of which was the fact that sin was in the world after the Deluge; (2) the legend recorded in Genesis iii, which was later accepted in Christian theology; (3) the Rabbinical doctrine of the evil imagination.

There is nothing in the Gospels to show that Christ approved of any of these theories, but we cannot base very much on the argument from silence. There is a remarkable figure to illustrate the wickedness of His days, mentioned by St. Matthew, xii, 43-45, and also by St. Luke, xi, 24-6. It tells of the expulsion of an evil spirit from a man and its subsequent meanderings through waterless places, where it found no rest, and finally decided to return to the original habitation. When it finds the house empty, swept, and garnished, seven other spirits more wicked than the first one accompany it to take possession of the man, the last state of whom is worse than the first. This might seem to favour a new demoniacal theory; on the other hand, it may be merely a figure to impress the audience with the wickedness of the Jews. It must be remembered, however, that most of the miracles of "casting out devils" took place in Galilee, where the people were backward compared with other parts of Palestine, and the figure may have been intended to be taken literally. Evil spirits were regarded as very real, even in more cultured circles than Galilee, and St. Paul's allusions to their activities show that their malign influence was generally accepted in the early days of Christianity. His admonition in 1 Cor. xi, 10, about a woman praying or prophesying with her head uncovered has obviously some connection with evil spirits; "For this cause ought the woman to have a sign of authority on her head, because of the angels."

The "angels" here is probably a reference to the watchers who are mentioned in other parts of the New Testament: Jude 6; 2 Peter ii, 4. Some think that there was a current belief that evil spirits whispered wicked suggestions into women's ears and that they were more susceptible to such suggestions when they were assembled for prayer or worship. Hence the necessity to cover their heads, and incidentally their ears, seemed quite natural, as they would then be less vulnerable to the evil spirits. This passage has perplexed commentators, and other explanations have been given, but it is irrelevant for the object of this work to discuss these. What is of fundamental importance is that the Garden of Eden legend was finally adopted by the Christian Church and was made the basis of a theological system which, in theory, still remains, in spite of the progress of anthropology and of the downfall of many cherished beliefs through the acceptance of biological evolution. There is nothing, however, to show that Christ accepted the Adam story.

In St. Paul's Epistle to the Romans, chapter v, there is a summary of his views on the Fall. The present work is not a treatise on theology, but it will be necessary to consider St. Paul's teaching, as it had a profound influence on the future of Christianity. It is probably correct to say that if there had been no St. Paul the religion of Europe would not have been Christian. Instead of quoting the various portions of this chapter, which is difficult in parts both in language and in the links of thought, it will be better to give a brief explanation of what was in the mind of the writer, more especially in verses 12-21.

The primary object is to bring out the wonderful grandeur and extent of the work of Christ in contrast with the devastating effects of Adam's transgression. The results of the Fall were found not only in inherited sinfulness, but also in inherited guilt—the liability to punishment on account of the primeval sin—and this punishment was physical death. As some (e.g., infants), who have not committed actual sin, die, the explanation is that they die on account of inherited or perhaps vicarious guilt. He then proceeds to extol the glorious difference between the work of Adam and that of Christ—a difference exhibited in the vastly greater wonder of Christ's work and of its result. Verse 15 reads, "But not as the trespass, so also is the free gift," and then goes on to show how Redemption is so far in excess of Ruin, more especially in quality of the cause and the effect. Redemption was not merely a reversal of the previous ruin; it was more than a reversal because it brought with it the exaltation which was given to the partakers of the

life of the Second Adam. This is the obvious meaning of the expression "much more" in verses 15 and 17. Difficulties present themselves to St. Paul in his elaboration of this theological system, and he deals with these as they arise. In verses 13-14 it is admitted that, while sin cannot be imputed where there is no law, nevertheless sin existed before the (Mosaic) law, because death reigned during this period, and the penal character of death is essential for the argument. No exceptions will be allowed by St. Paul, and the broken law must have been broken in Adam so that no one can ever escape or be exonerated. In verse 20 he teaches that the Commandments were given to be broken as much as possible, this multiplication of sins being divinely ordained that God's kindness might abound.

It is possible that St. Paul had a vague belief in a fall of conscious and intelligent beings before the fall of Adam, and that the infection had percolated downwards through Adam into the human family. Some of the early Fathers \* thought that there was some form of cosmic fall, and in comparatively recent times this idea has been resuscitated in various forms. Canon Peter Green finds no solution of the problem of pain and suffering except in a deep-seated corruption of the entire universe *ab initio*. It is outside the scope of this work to criticize these and other views regarding the Fall. As they are devoid of historical bases and, in the nature of the circumstances, are outside the range of scientific investigation, no useful purpose would be served by discussing them.

It is remarkable that during the Sub-Apostolic Age, about 120 years after the death of St. Peter and St. Paul, there is very little reference to the Adam Fall theory. The Epistle of Barnabas, which is assigned different dates, A.D. 70-9 by Lightfoot, but A.D. 130 by others, points out a parallelism between the serpents in the wilderness and the serpent of the Fall. It has already been mentioned that the Second Epistle of Peter, probably written about A.D. 150, refers to the Watcher theory. The Shepherd of Hermas which was written after A.D. 90 appears to assume the *yēçer* doctrine. This doctrine is also assumed in the Epistle of James, i, 14, which was written much earlier than The Shepherd of Hermas. Before Justin Martyr, who wrote about A.D. 150-55, we find that the only reference to the Adam Fall story appears in the Epistle of Barnabas. It is unnecessary to discuss the reasons for the delay in accepting the Pauline teaching on the subject; the fact remains that it was accepted, and an indication of the effect of the Fall story on the Christian outlook regarding women is found in the writings

\* It is adumbrated by Origen in *De Principiis*. There are hints of it in Philo's works,



of Tertullian (A.D. 160–230)—an outlook which was inherited from the Hebrew conception. In Ecclesiasticus xxv, 24, we read, “From a woman was the beginning of sin; and because of her we all die.” St. Paul’s opinion of women was obviously not very high, but nowhere does he advocate the odium which is attached to them in the writings of Tertullian. He maintains that a woman should go about in a humble garb, mourning and repentant, so that she can expiate that which she derives from Eve, the ignominy of the first sin, and the odium attaching to her as the cause of human perdition. In *De cultu feminarum* i, 1, he says: “Do you not know that you are an Eve? The sentence of God on this sex of yours lives in this age; the guilt must of necessity live too. You are the devil’s gateway; you are the unsealer of that tree; you are the first deserter of the divine law; you are she who persuaded him whom the devil was not valiant enough to attack. You destroyed so easily God’s image, man. On account of your desert—that is, death—even the Son of God had to die.” This gloomy doctrine had a profound influence on Christian thought, and at the Council of Mâcon in 585 a bishop expressed the opinion that a woman had not got a soul. His colleagues, however, dissented from this view; but the stigma on the sex still continued. If the modern mind revolts from such teaching it may be pointed out that vicarious suffering was considered an ordinance of Providence, and it was not for mortals to question the mysteries and justice of God’s dispensation.

We should expect that St. Paul, brought up a strict Pharisee, would be interested in the question of predestination, on which a difference of opinion existed among the various sects. Josephus tells us in *Antiq.* xviii, 1, 3, 4; xiii, 5, 9, that the Sadducees were defenders of free will and carried their defence so far that they denied predestination. On the other hand, the Pharisees and Essenes held extreme views of the opposite nature and left no place for human freedom. As predestination is closely associated with the question of free will or determinism and is clearly taught by St. Paul, it will be necessary to say something on the subject.

The word “predestination” is used with various shades of meaning. Sometimes it denotes the decree of God by which He has determined from eternity everything that happens. Sometimes it is restricted to human beings and denotes the decree concerning their everlasting happiness or misery. In a very much greater restricted sense it is used to denote merely predestination to eternal life. Of course to all minds which are interested in the problems of human existence the doctrine of predestination is very important, because it seems to supply a

simple answer to the diversities in men's characters and destinies. In Romans viii, 29–30, St. Paul writes as follows: "For whom he foreknew, he also foreordained to be conformed to the image of his Son, that he might be the first-born among many brethren; and whom he foreordained, them he also called; and whom he called, them he also justified; and whom he justified, them he also glorified." From this and a number of similar passages in the New Testament it may be assumed that there was a pre-ordination as an act of God and that any idea of a blind destiny must be excluded. As a result of this interpretation one section of Christendom has condemned millions of souls to an endless torment which, according to some eminent divines, even increased the joy of the saints, who were enabled to view the condemned souls from their own abode of felicity and to rejoice at the sight of their agony.

It would be impossible in a single volume to deal adequately with the controversy on this subject, and it will serve the object of this work better if the views of a few outstanding theologians and philosophers are considered. The first of these, and the one who more than any other has left a permanent impression on Christian teaching, is St. Augustine, Bishop of Hippo (A.D. 354–430). His early life, the story of his conversion, his *Confessions*, and much of his work are all so well known that it would be superfluous to say anything about them. The following chapter will deal, therefore, with a very limited part of his views—the part that is relevant to the object of the present work, predestination and free will.

## CHAPTER IV

### THE CONTROVERSY FROM THE DAYS OF ST. AUGUSTINE TO THE TIME OF THE REFORMERS

THREE great controversies threatened the peace of the Church during the days of St. Augustine, and a considerable amount of his time and energy was spent in combating these. His attack on the heresies of the Manicheans and the Donatist schism need not take up our time, and we shall deal with his attitude towards the Pelagian heresy, which has an important bearing on the subject discussed in the previous chapter. It may be remarked here that, though St. Augustine was very acute and subtle in his arguments, he was not always a consecutive thinker, and on some occasions his convictions appear to have been developed according to the polemical needs of the time and circumstances.

The Pelagian controversy would never have attained the importance that it did if Coelestius, a friend and follower of Pelagius, had not urged him into extremes. Some time after Coelestius had become a presbyter at Carthage the archbishop of the diocese, Aurelius, was warned that he was teaching heresy and six propositions were mentioned which were declared to be heretical: (1) Adam would have died, even if he had not sinned; (2) the sin of Adam injured himself alone, and not all mankind; (3) new-born children are in the same condition in which Adam was before the Fall; (4) it is not true that because of the sin and death of Adam all mankind die, neither is it true that because of Christ's resurrection all men rise again; (5) infants, even if unbaptized, have eternal life; (6) a man can be sinless, and keep God's commandments without difficulty, insomuch that even before the coming of Christ there were men who were entirely without sin; and the Law leads to eternal life as well as the Gospel. Although St. Augustine was not present at the Council which anathematized these propositions, he approved its decisions and soon afterwards explained the doctrine of original sin in his book, *On the Punishment and Forgiveness of Sins*, and in a later work, *On the Spirit and the Letter*. A considerable number of treatises against Pelagianism emanated from St. Augustine from A.D. 410 to 428, and a brief survey of his views expressed in these and other writings will now be given.

He accepted St. Paul's teaching in his Epistle to the Romans that the elect are saved because God had predestinated, chosen, called, justified, sanctified, and preserved them. He could not have been blamed if He had not redeemed anyone after the Fall nor must He be blamed if in His mercy He redeems only a few. When Adam transgressed God's command all conceivable sins were compressed into his sin, and children are infected by Adam's sin as well as by the sin of their parents—so much so, indeed, that even unbaptized infants will receive damnation. The Fall of man was the suicide of free will, and since the Fall man is unable to refrain from sin. It is sufficient to inherit sin to merit damnation. In the future state there will be degrees of felicity and damnation, those who have only original sin, like infants, escaping with milder punishment than those who have committed actual sin. In the intermediate state departed souls may obtain mitigation through Masses and alms of the faithful—a view which he is able to reconcile with the teaching in ii Cor. v, 10. After the judgment there are two states only, but different grades in them, and the pains of hell are eternal, though it may be supposed that God permits some mitigation from time to time.

It has already been pointed out that St. Augustine was not always a consecutive thinker, and this fact is shown by the inconsistency between the grace of God and the merit of man in his doctrine of salvation. He taught that a man is justified by free grace, not by the merits of his own deeds. Hence, if we wish to follow out such a doctrine to its logical conclusion, God rewards a man with eternal happiness merely for what He has bestowed upon him. Many minds recoiled from such a view of God, but this conception of the Creator did not present any difficulties to St. Augustine, whose main thought was the transcendent supremacy as well as the aloofness of God. No doubt he had learnt much of this from the Neo-Platonists, but when he exalted God's decrees to the practical annihilation of human freedom it tended to undermine all sense of individual responsibility. Whatever advantage St. Augustine had in dialectics and philosophical speculation, it must be conceded that there was much in favour of Pelagius from the side of morals and practical life. The Pelagian system maintained that there can be no sin where the will is not absolutely free—that is, able to choose good or evil. The Pelagian formula—"Si necessitatis est, peccatum non est; si voluntatis, vitari potest"—involved what is commonly known as the "liberty of indifference," or "power of contrary choice." This theory affirms that the will is free, but not in the sense that the individual is self-determined. It implies that at each moment of

life and in each volition, the will is able to choose good or evil, irrespective of the previous career of the individual. From this principle it naturally followed that human will takes the initiative in each man's salvation, and indeed is the determining factor in the process—a view in direct contradiction to the teaching of Augustine, who maintained that it is the divine will which takes the initiative.

It was easy for Augustine to show that the position of Pelagius was anti-Scriptural and to refute it from other standpoints, but in spite of this many were not quite convinced, and the rise of semi-Pelagianism was symptomatic of the dissatisfaction with the orthodox views. Semi-Pelagianism was an attempt to hold a middle course between the stern and uncompromising tenets of Augustine and the humanitarian views of Pelagius, and it arose almost at the same time in Southern Gaul and Northern Africa. In the latter Church there was a desire to adhere to the teaching of their great theologian, as might be expected, but the result was very disconcerting in some cases. It is said that the monks at Atramentum either became utterly despondent or sank into licentiousness through the doctrine of predestination. Augustine compiled two treatises which showed that when God ordains the end He also ordains the means, and hence if He ordains anyone to eternal life He thereby ordains him to holiness and zealous efforts. Some of the monks had attempted a compromise in the meantime and had ascribed sovereign grace to God while leaving man's individual responsibility intact. A moderate party had also arisen at Marseilles under the influence of Cassian, and his scheme was afterwards advocated by Vincent of Lerinum and Faustus of Rhegium. Faustus was a very strong opponent of the doctrine of arbitrary predestination, and he also advocated, as some others did, the necessity for the co-operation of the divine and the human will. Without going fully into the history of the controversy, it will be sufficient to deal with the final result. In A.D. 529 Pope Felix IV summoned a Synod at Orange in Southern Gaul, and amongst the points which it settled the following were very important for the future of the Church:—

(1) By the sin of Adam, free will is so weakened that henceforth no man can love God in a suitable manner, believe in Him, or act for God's sake, unless grace has first come to him. Thus that glorious faith of Abel, Noah, Abraham, Isaac, and other ancient Fathers, on account of which the Apostle praises them, was imparted to them, not through the natural goodness which was in the beginning given to Adam, but by the grace of God. (2) All, however, are able, after they have

received grace through baptism, with the co-operation of God, to accomplish what is necessary for the salvation of the soul. (3) It is in no way our belief that some are predestinated by God to evil, rather, if there are any who believe a thing so evil, we with horror say anathema. (4) In every good work the beginning does not come from us; but God, without any previous merits on our side, inspires us with faith and love, so that we seek for baptism, and after baptism can, with His assistance, fulfil His will.

This Synod practically concluded the whole of the Pelagian and semi-Pelagian controversies for the ancient Church, and after this a moderate Augustinianism prevailed, although extremists arose from time to time. In the ninth century the old Predestinarian controversy was revived by Gottschalk, a monk in the Rheims monastery, who held and taught a twofold election—those for whom Christ died to eternal life, the reprobate to eternal death. He was handed over to his metropolitan, Hincmar, Archbishop of Rheims, for admonition and correction, and at a synod held at Crecy he was deposed from the priesthood and imprisoned for the remainder of his life. It is remarkable that, while Hincmar admitted predestination to life and also the consequent abandonment of the rest of mankind to their sinful state, yet he persecuted Gottschalk for maintaining a predestination to punishment. One incident gave a very pronounced character to this period of the development of doctrine. John Scotus Erigena was called in by Hincmar to confute the insubordinate monk, and he dealt with predestination in a metaphysical manner where the theologians of the time were unable to follow him. He argued that, as God was eternal, foreknowledge and predestination—mere temporal relations—could not be properly predicated of Him. He held that sin and its consequences in death are nonentities “. . . for sin is nothing at all—only a negation, and punishment is simply the displeasure of the sinner at the failure of his evil aims. Sin lies outside of God, and does not exist for Him at all. He does not even foreknow it, much less foreordain it, for God knows only what is.” While this orthodoxy was considered more dangerous than the heresy which it was supposed to combat, perhaps it was fortunate for Scotus that it was too abstruse for proceedings to be instituted against him.

This controversy was a prelude to a discussion which was carried on during the scholastic period, and the views of St. Thomas Aquinas must be considered. In substance his doctrine differs very little from that of Augustine, and he teaches very definitely that predestination is an essential part of the divine providence. Some, a fixed number, are ordained to

life eternal and others to fail of this end, and this predestination does not depend on any foreseen difference of character. Aquinas's idea of God was Aristotelian—"first mover, itself unmoved"—and he maintained that God is in all things by His power, presence, and essence. His theory of the divine concurrence seemed to provide a philosophical basis for Augustinianism. All things are governed by divine providence through two classes of secondary causes—the necessary or natural and the contingent or voluntary. The mediate or proximate causes of everything that occurs in the natural world are necessary, but the proximate causes of human actions are the voluntary motions of the will. While both are set in motion by God, nevertheless the actings of voluntary causes remain voluntary—a view which, while possessing the appearance of leaving the will free, obviously presents serious difficulties. Man determines his own course of action freely after a certain process of rational comparison, unlike the animals, which are immediately determined to their ends by the instinct of the moment. The freedom referred to is obviously a freedom from the immediacy of an impulse, and this freedom is based upon man's possession of reason as a power by means of which he uses comparison, memory, and forethought. The will is therefore subordinated to reason in so far as it chooses what reason has pronounced to be good, and this does not necessarily imply an absolute freedom of the will. Indeed, the doctrine can be described as a moderate determinism. A curious result of the Thomist doctrine is that the divine will, like the human will, is subject to rational determination, so that right is not right because God wills it, but that God wills it because it is right. There are some theologians who hold this view still, and who maintain that moral distinctions are antecedent to the divine commandments. The question of the objectivity of moral judgments is, however, outside the present inquiry.

The view of predestination which is based on the idea that God is the sole cause must, to be consistent, give some explanation of the origin of evil, and Aquinas attempted to do so by postulating three principles: (1) All kinds of creatures are necessary to a complete universe, and these must belong to the lowest as well as to the highest; (2) There cannot be a perfect universe without the existence of free will, and this necessarily involves the risk of evil; (3) Evil is a negation. It cannot be said that these points and the arguments which are based upon them are really satisfactory.

Aquinas modified Augustine's doctrine of original sin to a small extent. While the sin which originated with Adam was loss of natural goodness and led to rebellion of the lower

parts of man against the higher, the natural capacity to know and to will the good was only weakened, not eradicated. He rejected the Augustinian view of the damnation of unbaptized infants for whom the *Limbus Infantum or Puerorum* was less horrible even if it deprived children of the "vision of God."

It would be tedious and also profitless to dwell at length on the history of the controversy between the rival systems of Jesuits and Jansenists, and this chapter will conclude with a short reference to the teaching of some of the Reformers.

The Schoolmen had taught that the Fall was from supernatural to mere nature, but Luther went beyond this, and held that it was to subnature. Man was degraded to the state of the felon, and so great was his depravity that human nature had lost one of its essential faculties—that of knowing, loving, and serving God. Man has no more power to turn to God than a stone or a tree-trunk. The Reformation implied an Augustinian reaction with a restoration of Paulinism, the Bible being substituted for the authority of the Church, and St. Paul's Epistles were the kernel of the Bible. Calvin believed that infants, the moment they were born, were odious and abominable to God. Both Reformers were determinists and held that the arbitrary and inscrutable will of God was the ground of double predestination, the elect to eternal life, the reprobate to eternal loss. The Lutherans, however, always shrank from this conclusion, and Luther transferred the origin of evil to the devil. Calvin, on the other hand, attributed it to the will of God. Calvin's conception of God's law showed itself in the rigidity of the system which he established at Geneva, where he used the State as the instrument for punishing those whom he supposed to be opposed to the divine mind. A child was beheaded for striking his parents—an instance which is typical of scores of others that took place in the reign of terror. The doctrine of original sin led to an utter distrust of child nature, and this view was strongly impressed on Bunyan, who bids parents remember that children are cursed creatures, whose wills, being evil, are to be broken.

How far is Christian thought to-day influenced by the doctrine of the Fall? The beliefs of many on the matter are of a very vague character, though officially the members of the various religious bodies are supposed to be guided by creeds or some forms of doctrinal tenets. In the Church of England, Articles IX, X, and XIII contain strong affirmations of the Augustinian conceptions. In common with Augustine and the Reformers, Article XIII asserts that works done before grace have the nature of sin. The Council of Trent decided that the virtuous actions



of pagans are not sins, and most readers will agree that the Roman Catholic view contains more truth than the Anglican. Of course private interpretation in the Church of England is allowed to a very much greater extent than in the Roman Catholic Church, and general assent to the Articles does not necessarily imply that they are agreed to in detail as formulating theological views which must be accepted by every one. As an instance of this private interpretation the following quotation from Dr. Cyril Alington is interesting. In Chapter XII of his work, *The Fool Hath Said*, he says: "To condemn generations yet unborn on account of the sin of Adam could hardly be just, and if that were indeed the Christian belief we could hardly hope to commend it to the national conscience." He goes on to show that such a doctrine has little relation to Jewish or Christian belief, and informs us that *St. Paul's authority cannot be claimed as superior to Christ*. But does Dr. Alington realize that undermining the authority of St. Paul is really undermining a very large portion of Christian theology? Has he considered the various ramifications which have issued from St. Paul's doctrine of the Fall, and that these must be excised from the Christian faith if St. Paul's veracity is impugned? It is scarcely necessary to remark that if the teaching of St. Paul is rejected there will be very little left of what is commonly known as Christianity, except the ethical standards laid down by Christ, and, as many of these can be found in the Talmud and the Old Testament, the view that Christianity is unique in the religions of the world would scarcely be tenable. Dr. Alington goes still further in the work of destruction. Dealing with Article XVII, which is concerned with predestination and election, he tells us that the Articles were drawn up with the laudable motive of minimizing the difficulties which divided us from Continental Protestants. To secure their support we went farther than we wished, and our purpose was legal and political rather than religious. According to this view, while the teaching of the Article just mentioned binds the members of the Church of England to the belief that Predestination to Life is the eternal purpose of God and that He decreed such for certain persons before the foundations of the world were laid, yet it is unnecessary to accept this teaching.

Enough has been said on this subject, but, before turning our attention to the philosophical side of the question, an appeal to readers to be a little sympathetic to the theologian in the difficulties which confront him, more especially in modern times, may not be out of place.

## CHAPTER V

### THE PROBLEM AS PRESENTED BY DESCARTES'S PHILOSOPHY

WE now reach a stage where society was passing through a transition from the ecclesiastical to the secular ideal. The necessary conditions for such a change had been brought about by a great movement which combined various aspects and is known as the Renaissance. The drama of human life had previously been played on the stage of "heaven and earth," but now this seemed a mere illusion. The centre of the universe was shifted from our planet, which shrank into a speck in the great cosmos, and men's imagination was profoundly impressed with the thought of the insignificance of human life and effort. The narrow theological view which hitherto had dominated life and thought, the conception of God with a local habitation in the heavens, the beliefs which men entertained regarding His interference in the petty affairs of this world, though surviving for a time in certain quarters, were destined ultimately to disappear. As might be expected with the collapse of many of the old tenets, great changes were mirrored in scientific method as well as in philosophical theory. Individualism began to assert itself, and principles were no longer accepted on the affirmation of external authority. Untrammelled by traditional opinions of the past ages, men now interrogated nature, and the appearance of scientific Rationalism as a phase of thought opened up a new and extensive vista hitherto undreamed of. In such an age, when authority was shifting from the ecclesiastical arm and when many of the old tenets which once had been accepted as the very bulwarks of society were being discarded, it is not surprising if men should look for some sure basis on which to erect a system that would satisfy the intellectual cravings of the time when certainty seemed to be built on a foundation of sand.

René Descartes (1596–1650), in attempting to construct a philosophy on a basis which should be free from all the uncertainties of the older systems, started by doubting everything that could possibly be doubted. In carrying this doubt as far as it would go, there was one thing which he could not doubt—his existence as a thinking being—*Cogito ergo sum*. It must be remembered that Descartes did not doubt merely

for the sake of doubting; his scheme was constructive. As he informs us: "Not that in this I imitated the sceptics, who doubt only that they may doubt and seek nothing beyond uncertainty itself; for, on the contrary, my design was singly to find ground of assurance, and cast aside the loose earth and sand that I might reach the rock or the clay." Modern philosophy is generally considered to have started with Descartes, and a brief survey of his system will now be presented. It must not be expected, however, that anything more than a mere outline which is relevant for the purpose of this book will be given. Readers who are interested in his philosophy will find it profitable to consult his various works, a list of which is given at the end of the chapter.

Starting with the fact of consciousness, and doubting everything else that could be doubted, the first step to attain the wider reality which was provisionally doubted is to prove the existence of God. This proof is substantially as follows.

Of the numerous ideas which we find in our mind some appear to come from our own nature, others to emanate from external compulsion, and others seem to be mere fictions which the mind has put together. Is there any evidence that anything exists outside the mind to correspond to these ideas? This evidence is found through the principle of causality, which asserts that in every cause there must be as much reality as reveals itself in the effect. If it were not so a portion of an effect would arise out of nothing. Assuming, then, that there exists in my mind any single idea which is obviously too great to have originated from my own nature, I can feel certain that there is a commensurate cause outside of me. It is true that in most cases I can discover nothing in my ideas which requires more than my own nature to produce, but there is one outstanding exception—the idea of God. "By the name God, I understand a substance infinite (eternal, immutable), independent, all-knowing, all-powerful, and by which I myself, and every other thing that exists, if any such there be, were created. But these properties are so great and excellent, that the more I consider them the less I feel persuaded that the idea I have of them owes its origin to myself alone. And thus it is absolutely necessary to conclude, from all that I have before said, that God exists; for though the idea of substance be in my mind owing to this, that I myself am a substance, I should not, however, have the idea of an infinite substance, seeing I am a finite being, unless it were given me by some substance in reality infinite." \* Here, then, is the bridge between myself and external reality, and the real existence of God must be postulated as the only

\* *Meditations*, 111.

being great enough to explain the presence of the idea of God which undoubtedly exists. The independent isolated self which is presupposed in the argument, "I think, therefore I exist," turns out to be limited and imperfect, and hence to imply a non-self.

Having established the existence of God, it is easy to take the next step—to prove the existence of matter. In the natural conviction that there is a material world there is the possibility that an evil genius has deceived me, but such an act of deception cannot be attributed to God, in whose perfection we believe. In *The Principles of Philosophy*, XXIX, he proves that God is not the cause of our errors. "The first attribute of God which here falls to be considered is that He is absolutely veracious and the source of all light, so that it is plainly repugnant to Him to deceive us, or to be properly and positively the cause of the errors to which we are consciously subject." Hence we must discard the doubt in the existence of matter, otherwise God would be responsible for making us believe a lie.

It is not within the province of the present treatise to offer a detailed criticism of any system, as its object is merely to present the historical side of the controversy on free will or determinism. It may not be out of place, however, to remark at this stage, what many readers probably know already, that Descartes's arguments for the existence of God and of the external world are not very convincing. In proving the former, the non-self, as we have already pointed out, is identified with God, but actually all that can be proved by the ontological argument is that there exists a reality which is independent of, and external to, the mind. It is true that if only we could prove that reality is moral this would provide some grounds for accepting the existence of God. As Kant showed, however, no purely intellectual argument can prove that reality is moral. Again, the argument by which the existence of the external world is inferred from the existence of God is an obvious *petitio principii*. Descartes admits that we may be deceived in thinking that what we clearly and distinctly conceive is true, but this supposition is incompatible with the goodness of God, who cannot deceive us. Nevertheless, if what we clearly and distinctly conceive is not true, the argument for the existence of God contains a fallacy. It is unnecessary to dwell on this matter, and we shall proceed to examine other parts of his system.

As appears from what has been said, Descartes draws a sharp distinction between mind and matter—the two substances into which the world of experience is divided. The mind or soul is a thing which thinks, but difficulties arise about the nature

of matter which makes itself known to the ordinary man by certain qualities—taste, colour, sound, etc. As some of these are only secondary effects upon our sensibility, without any counterpart in the thing itself, what becomes of the appeal to the veracity of God? Descartes avoids this difficulty by his theory of truth and falsity. When I look at a red object the sensation of redness is a datum of immediate experience about which there can be no doubt. If, however, I go beyond this and infer that the sensation has a counterpart in some quality out in space, this is going beyond certain knowledge, and in drawing conclusions that are not warranted I am to blame, not God. We have no grounds for complaint if God gives us a knowledge which is less than perfect; there would be room for complaint only if He deceived us, and such a deception would arise only if a thing was false which we see clearly and distinctly to be true. The only quality which can be conceived clearly is extension, and this is evident from the fact that the truths of geometry—the clearest of all sciences—apply to extension. In his physical philosophy he attempted to explain everything on mechanical principles, and his conception of a purely mechanical world is the basis of modern Materialism.

The essence of matter is extension, and it is infinite and infinitely divisible, for which reason atoms cannot exist. Movement is so different from extension that it must originate from outside—from God—who created some bodies having motion and others having rest. It follows from the unchangeable nature of God that the quantity of motion as well as of rest is invariable. This does not imply that there is conservation of energy, as the following quotation from *Principles* shows: "For, although motion is nothing in the matter moved but its mode, it has yet a certain and determinate quantity, which we easily understand may remain always the same in the whole universe, although it changes in each of the parts of it. So that, in truth, we may hold, when a part of matter is moved with double the quickness of another, and that other is twice the size of the former, that there is just precisely as much motion, but no more, in the less body as in the greater; and that in proportion as the motion of any one part is reduced, so is that of some other and equal portion accelerated." The mechanical nature of the universe was extended to comprise all creation, human beings included, though with certain reservations which will be noticed later. In the world of matter nothing could be admitted which suggested self-determination. All its energy must be communicated, not self-originated, and hence brutes are only automata. Their bodies are part of the material world, and they are subject to

the same mechanical laws that govern other things. Although Descartes spent a lot of time in dissecting, he found no reason for modifying this view. Animals are simply material things more complex than the rest, and their life is the expression of the complexity of their mechanism. It is unfortunate that some of the Cartesians applied this theory even to the extent of treating animals with extreme severity. When Malebranche was rebuked for mercilessly beating a friendly dog, he replied: "You don't suppose it feels?" Vivisection was practised by Descartes's followers without the slightest compunction, although Descartes himself frequently said that it would be better to treat animals as though they did feel, *in the interests of moral training*. He was aware of the difficulties besetting him in his view that animals were only automata, as the following passage will show: "The greatest of all the prejudices we have retained from infancy is that of believing that brutes think. The source of our error comes from having observed that many of the bodily members of brutes are not very different from our own in shape and movements, and from the belief that our mind is the principle of the motions which occur in us—that it imparts motion to the body, and is the cause of our thoughts. Assuming this, we find no difficulty in believing that there is in brutes a mind similar to our own; but having made the discovery, after thinking well upon it, that two different principles of our movements are to be distinguished—the one entirely mechanical and corporeal, which depends entirely on the force of the animal spirits, and the configuration of the bodily parts, and which may be called corporeal soul, and the other incorporeal, that is to say, mind or soul, which you may define as a substance which thinks—I have enquired with great care whether the motions of animals proceed from these two principles, or from one alone. Now having clearly perceived that they can proceed from one only, I have held it demonstrated that we are not able in any manner to prove that there is in the animals a soul which thinks. I am not at all disturbed in my opinion by those doublings and cunning tricks of dogs and foxes, nor by all those things which animals do, either from fear, or to get something to eat, or just for sport. I engage to explain all that very easily, merely by the conformation of the parts of animals." (*Letter to Henry More*.)

If the activities of animals can be thus explained on purely mechanical grounds, how can those of human beings be explained? Descartes was not prepared to apply his thesis to every department of men's actions, though he held that the more habitual and reflex actions are mechanical. The mind was able to interfere to some extent with the motions of the body,

and this leads us to another difficulty in the system—the union of the body and spirit in man. How are we to explain the union of two substances which are independent and each of which exists in its own right?

Descartes admits that even God cannot make these two substances one, and the union of the two must be taken as an empirical fact. The difficulty of explaining how a subjective result can be produced by matter and how an objective result can be effected by mind is overcome by Descartes by his theory of the functions of the pineal gland, which is the seat of this interaction. Here the “animal spirits,” or fine particles of the blood, can be deflected by the influence of the soul, and by their entrance into the various nerves the body is determined to one action or another. In this way they are the instruments by which the soul moves the body. There is a certain resemblance between some parts of this explanation and the arguments propounded by a noted physicist in recent times, which will be dealt with at a later stage of the present work. Ethical problems suggest themselves at this point. Admitting that in man the unity of mind and body turns the mere mechanical reaction of a stimulus in animals into action and reaction mediated by sensation, emotion, and passion, as Descartes taught, how can the movements of the latter be altered or modified by pure reason, if the nature of passion is fixed by the original constitution of the body? If the same being is determined by passion from without and reason from within, how can such a spiritual being maintain its character as self-determined? Surely it is a contradiction to assert that self-determination can exist in a being whom the external element of passion makes subservient to external impressions. One obvious solution is to crush the passions, but Descartes would not admit that the passions should be annihilated, because they were provisions of nature for the protection of the unity of the soul and body, stimulating us to the acts necessary for this purpose. Nor, on the other hand, could he admit that the passions were capable of being completely spiritualized, though he pointed out that every passion had a lower and a higher form. In the first of these the passion is based on the obscure ideas which are produced by the motion of the animal spirits; in the latter it is connected with the clear and distinct judgments of reason regarding good and evil. He drew an important distinction between things which are in our power and things which are not in our power, the latter including all outward things. For this reason we should regard them as determined by an absolute fate, or the eternal decree of God. Just as we cease to wish for the impossible, so in the same way, to subdue

our passions, we need only convince ourselves that our efforts are unavailing to secure certain things.

From Descartes's definition of mind as thought, and emotions or passions as states where pure thinking is affected by body, it follows that emotions must be kept down to secure clear thinking. To keep passions down we must think clearly, know fully, under the guidance of wonder, which, of all the passions, is the one that makes for knowledge and may be made to support mind as thinking. The soul, by its power of thinking, is able to suppress one passion indirectly by dwelling on another, the pineal gland diverting the course of the vital spirits to accomplish this. He saves the freedom of the will, but his arguments are not always very convincing. Thus in *The Principles of Philosophy*, VI, he shows how we possess a free will, by which we can withhold our assent from what is doubtful and so avoid error. "But meanwhile, whoever in the end may be the author of our being, and however powerful and deceitful he may be, we are nevertheless conscious of a freedom, by which we can refrain from admitting to a place in our belief aught that is not manifestly certain and undoubted, and thus guard against ever being deceived." He returns to this subject (XXXVII-XLI), and holds that the chief perfection of man is his being able to act freely or by will, and that it is this which renders him worthy of praise or blame. He realizes the difficulty in reconciling the freedom of the will with divine pre-ordination, but avoids the problem by falling back on the limitations of the human mind. Our minds are limited, while the power of God, "by which He not only knew from all eternity what is or can be, but also willed and pre-ordained it, is infinite. It thus happens that we possess sufficient intelligence to know clearly and distinctly that this power is in God, but not enough to comprehend how He leaves the free actions of men indeterminate."

Although Descartes exercised a profound influence in his age, his immediate followers were not satisfied with his lack of explanation of the possibility of the mutual influence between soul and body. If matter and mind are so diverse, how can there be any such thing as one influencing the other? The answer was provided by the theory known as Occasionalism, which is specially associated with the names of Geulincx and Malebranche. According to this view there is really no interaction between body and soul, but the appearance of it is due to the action of God. Thus, the stimulation of the optic nerve by the rays of the sun is not the cause of the sensation of light, but on *occasion* of the stimulation God causes the sensation of light to take place. Nor is the will to move the



hand the actual cause of its movement, but on *occasion* of the will God causes the hand to move. Occasionalism supposes that the mind or soul, when it is perceiving, depends immediately on God, and there is no mediation of the bodies which it is said to perceive. This view gets rid of the necessity for any influence passing between two unlike substances.

Occasionalism showed the direction in which Descartes's philosophy was to lead. He had divided the world into mind and matter, and a third more intimate reality—God—and he had recognized that the first two are not true substances in the ultimate sense, because they cannot be conceived apart from God. There seemed to be something inconsistent in applying the title "substance" to mind and matter when he meant by this term something which can be conceived as completely independent of anything else. Occasionalism was more logical when it appealed to God's power, but it was left to a greater than Descartes or the Occasionalists to point the way to a more intimate connection between God and the world.

#### LITERATURE

Descartes, *Discourse upon Method*; *Meditations*; *Principia Philosophiæ*; *Emotions of the Soul*.

Translations.—Haldane and Ross (*Works*, 2 Vols.); Veitch (*Method, Meditations, Selections from the Principles*); Torrey (*Selections*).

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## CHAPTER VI

### SPINOZA'S DOCTRINE OF FREE WILL

AT the end of the preceding chapter it was pointed out that there were certain inconsistencies in the Cartesian system and that some of Descartes's followers attempted to rectify its defects. It is not surprising that Spinoza (1632-77), who started as a Cartesian, should end by constructing a system on the basis of one Substance which he identified with God or Nature, of which extension and thought are "attributes." It may be admitted that it is difficult to give an adequate account of Spinoza's philosophy in a short compass. His system is not easy and is liable to serious misconstructions—so serious, indeed, that some philosophers since his days have applied to him the titles "this famous Atheist" and "a God-intoxicated man." Perhaps it should be added that if the title "religious" is restricted to the adherents of orthodox theology, Spinoza must be included among the non-religious. The personal God of the Christian finds no place in his philosophy, nor does the government of the world according to purpose. He denies the freedom of the will, though, as will be shown later, such an attitude is associated with the highest ethical attainments. At times it is difficult to draw a clear line of demarcation between his doctrine and the out-and-out naturalism which identifies God with the laws of the physical universe. Nevertheless Spinoza is convinced that the idea of religion which he advocates is the only worthy one, and that the current conceptions are utterly irreligious.

In Spinoza's philosophy there is only one real thing—God, Substance, Nature, all of which mean the same thing, with an infinite number of attributes by which God realizes Himself. There are only two ways in which we are capable of perceiving these manifestations, under the attributes of Thought and Extension—that is, as bodies and minds. Of course God's nature is not limited to these two forms, because, being infinite, He has an infinite number of attributes, but no others are known to us. These two attributes never interfere with each other or overlap each other, and the nature of God can be expressed in terms of either. There is a complete parallelism between them, and there is nothing in the mind which is not the idea or mental counterpart of something material. In the same way

there is nothing in the material world of which there is not a corresponding idea. This doctrine, based upon spiritualistic monism, makes God the only real Substance, Who manifests Himself by producing changes and motions in two parallel orders of mind and matter, these two being quite distinct, or under His two attributes of Thought and Extension. As might be expected, this doctrine would lead to a conception of God very different from that of Descartes, who divided the world into two Substances, distinct from each other, and a God separate from both. The Rationalism which arose from this view removed God still more from the world and almost isolated Him from His work. Spinoza attempted to show the close connection between God and the world, and to interpret all reality in terms of His ultimate perfection.

The starting-point of Spinoza's thought is the perception of the unreality of finite things. After experiencing the futility of all the surroundings of social life, he sought for something of which the attainment would enable him to enjoy continuous, supreme, and unending happiness. Recognizing the evils which ensue from the fact that happiness or unhappiness is made to depend on the quality of the objects which we love, these objects being perishable, where can true joy be found? "But love toward a thing eternal and infinite fills the mind wholly with joy, and is itself unmingled with any sadness; wherefore it is greatly to be desired and sought for with all our strength." (*Improvement of the Intellect*, Elwes's translation, Vol. II, pp. 3-5.)

The chief end of philosophy, therefore, is to escape from the phenomenal world, which gives no felicity, and to identify ourselves with that true reality which only is worthy to elicit our love and able to satisfy it. This object is the eternal unity of the universe, which embraces all things finite and bestows on them whatever reality they possess; in other words, it is God. To Spinoza the noblest state of the human spirit was this "intellectual love of God" produced by a sufficient knowledge of the parallel systems of matter and mind in which the divine nature reveals itself to us. This doctrine has little in common with the Atheism with which Spinoza was charged. Indeed, his system has this much in common with Christianity: it implies the immanence of God in every individual person or thing, though it does not, like Christian theology, teach the transcendence of God. Probably many have misunderstood the implications in Spinoza's claim that science explains all physical events, even the actions of the human body, in physical terms. His conception of Nature as capable of being expressed in terms of a material system did not, however, dispense with

God. In his age scientific students had concentrated chiefly on problems of mechanics and physics, and, in dealing with the laws of motion and gravity, all bodies, organic and inorganic alike, were treated equally. Spinoza's ideal of knowledge was so very much that of the mathematician and physicist that little justice was done to the plurality of individuals. The minds of men and the thoughts which constitute them are parts of the great eternal system of thought which is God viewed under "the attribute of thought" in the same way in which our bodies are parts of the eternal system of matter in motion which is God viewed under the "attribute of extension."

This brief outline of Spinoza's system will suffice for our chief object—an examination of his views on human free will. It has already been pointed out that his system has been very much misunderstood, and probably many would include him among the "Atheists" on account of his denial of free will, though, as stated at the beginning of the chapter, this denial was not inconsistent with high ethical attainments.

In the Appendix to *Ethic* \* (First Part, "Of God"), Spinoza explains why men imagine themselves to be free. The following quotation from the beginning of the Appendix gives a summary of his conclusions in the thirty-six Propositions contained in the First Part and is very important in so far as it has a bearing on free will:—

"I have now explained the nature of God and its properties. I have shown that He necessarily exists; that He is one God; that from the necessity alone of His own nature He is and acts; that He is, and in what way He is, the free cause of all things; that all things are in Him, and so depend upon Him that without Him they can neither be nor can be conceived; and, finally, that all things have been predetermined by Him, not indeed from freedom of will or from absolute good pleasure, but from His absolute nature or infinite power."

He then proceeds to remove various prejudices which might hinder the perception of the truth of what he has previously demonstrated. All these prejudices depend on the common view that everything in nature works to some end, and indeed it is considered certain that God Himself directs all things to some end—the falsity of which view he demonstrates. To prove that men are not free, he starts with the axiom that they are born ignorant of the causes of things, and that they have a desire, of which they are conscious, to seek what is profitable for themselves. Hence a man thinks that he is free because he

\* *Ethic*. Translated by W. Hale White; Revised by Amelia Hutchinson Stirling.

is conscious of his wishes and appetites, while at the same time he is ignorant of the causes by which he is led to wish and desire. In addition, as a man does everything for an end, this end being what is profitable for him, he attempts to discover merely the final causes of what has happened. If he hears from others what these final causes are, he is satisfied, having no reason for further uncertainty on the matter. If, however, not hearing them from others, he reflects upon the ends which determine him to certain actions, he judges the mind of other people by his own. Again, since he discovers many means which contribute to his own interests—i.e., the eyes, teeth, plants, animals, etc.—all natural objects are considered as means for obtaining what is profitable. As these were not created by man, he has reason to believe that there exists some other person who has prepared them for his use, and hence he infers that some ruler of nature, endowed with human liberty, has made these things for his service. Having heard nothing about the mind of such a ruler or rulers, he judges of it from his own, and so affirms that the gods direct everything for his advantage with the object of making him hold them in high honour: “This is the reason why each man has devised for himself, out of his own brain, a different mode of worshipping God, so that God might love him above others, and direct all nature to the service of his blind cupidity and insatiable avarice.”

This prejudice has thus been turned into a superstition, and the attempt to show that nature does nothing in vain seems to end in showing that nature, the gods, and man are alike mad. Where has it led men? Not only have beneficial things been observed, but also much that is injurious, like storms, earthquakes, and diseases, and it was affirmed that these occurred either because the gods were angry by reason of wrongs which man had inflicted on them, or because of sins committed in the method of worshipping them. In spite of the fact that the pious and the impious suffered indiscriminately, the prejudices still remained, and it was considered indisputable that the judgments of the gods pass man’s comprehension. “This opinion alone would have been sufficient to keep the human race in darkness to all eternity if mathematics, which does not deal with ends, but with the essences and properties of forms, had not placed before us another rule of truth.” The conclusion is that nature has set no end before herself, and also that all final causes are only human fictions.

It will be better at this stage to give some quotations from Spinoza to show that God does not act from freedom of will nor do human beings:—

*Ethic*, Part 1, Prop. XXXII. “*The will cannot be called a free cause, but can only be called necessary.*”

Demonst.—“The will is only a certain mode of thought, like the intellect, and therefore (Prop. 28) no volition can exist or be determined to action unless it be determined by another cause and this again by another, and so on *ad infinitum*. And if the will be supposed infinite, it must be determined to existence and action by God, not in so far as He is substance absolutely infinite, but in so far as He possesses an attribute which expresses the infinite and eternal essence of thought (Prop. 23). In whatever way, therefore, the will be conceived, whether as finite or infinite, it requires a cause by which it may be determined to existence and action, and therefore (Def. 7) it cannot be called a free cause, but only necessary or compelled.—*Q.E.D.*”

Corol. 1.—“Hence it follows, firstly, that God does not act from freedom of the will.”

*Ethic*, Part 2.—“Of the Nature and Origin of the Mind.” Prop. XLVIII:—

“*In the mind there is no absolute or free will, but the mind is determined to this or that volition by a cause, which is also determined by another cause, and this again by another, and so on ad infinitum.*”

Demonst.—“The mind is a certain and determinate mode of thought (Prop. 11, Pt. 1) and therefore (Corol. 2, Prop. 17, Pt. 1) it cannot be the free cause of its own actions, or have an absolute faculty of willing or not willing, but must be determined by this or that volition (Prop. 28, Pt. 1) by a cause which is also determined by another cause, and this again by another, and so on *ad infinitum*.”

It is important to notice what Spinoza means by the will. This is explained in the Scholium which follows the above proposition. “By the will I understand a faculty of affirming or denying, but not a desire; a faculty, I say, by which the mind affirms or denies that which is true or false, and not a desire by which the mind seeks a thing or turns away from it.” Having previously shown that these faculties are universal notions which are not distinguishable from the individual notions from which they are formed, the question arises: “Are the volitions themselves anything more than the ideas of things?” In the next Proposition he shows that “In the mind there is no volition or affirmation and negation excepting that which the idea, in so far as it is an idea, involves.” As a Corollary from this Proposition it is demonstrated that the will and the intellect are one and the same thing, and Spinoza proceeds to answer the objections which have been raised

against this view. The first objection is that the will is more widely extended than the intellect, and hence differs from it. The second is that experience teaches us the possibility of suspending our judgment, so as not to assent to the things which we perceive. The third is that we do not require a greater power for affirming a thing to be true which is true than for affirming a thing to be true which is false—in other words, one affirmation does not seem to contain more reality than another. The fourth is that if a man does not act from freedom of will, what would he do in a state of equilibrium? Would he not die from hunger and thirst? If this be granted, “do we not seem to conceive him as a statue of a man or an ass?” If it is denied that he would thus perish, he will possess the power of doing what he likes, and hence will determine himself. It is unnecessary to consider Spinoza’s answers to these objections, and it now remains to see what service is rendered to human beings by this doctrine that in the mind there is no absolute or free will.

A knowledge of this doctrine is of service in so far as it teaches that we do everything by the will of God alone. In proportion as our acts become perfect and we understand God more fully, we are partakers of the divine nature. Hence our highest happiness consists in the knowledge of God alone, and by this knowledge we are drawn to do only those things which love and piety persuade. Virtue and the service of God are happiness in themselves and the highest liberty. This knowledge also teaches us to bear every form of fortune with equal mind, knowing that all things follow from the eternal decree of God, “according to that same necessity by which it follows from the essence of a triangle that its three angles are equal to two right angles.” Then again, the doctrine contributes to social welfare, teaching us to hate no one and to be content with what we possess, helping our neighbour, not from womanish pity, partiality, or superstition, but by the guidance of reason alone. Lastly, it contributes to the advantage of society, in so far as it teaches us by what means citizens are to be governed and led, with the object that they may freely do the things which are best.

Such is Spinoza’s doctrine of freedom, and it is obvious from it that the wise man is much stronger and better than is the ignorant man who is led by mere desire and never attains true satisfaction of soul, being without consciousness of himself, of God, and of things. It may not be relevant to his teaching to say anything about his own personal life, but justice demands that some reference should be made to the beauty of his character as well as to his profound intellect. Fame, position, and money

had very little attractions for him. Frugal and temperate in his habits, he preferred simplicity and the freedom associated with it, but not for any mercenary motives. When a medical student offered him two thousand florins, he declined the gift because he thought it would divert him from his studies and occupations. The same medical student, Simon de Vries, wanted to make Spinoza his heir, but he declined the offer and persuaded him to leave the estate to his brother. This was done on condition that Spinoza should receive an annual sum sufficient for his support, and when De Vries died it was proposed that the annuity should be five hundred florins. Spinoza refused to accept more than three hundred, as he considered five hundred too much. His sisters attempted to deprive him of his patrimony, but he secured his title to it by legal deed, and then voluntarily relinquished his share to them, retaining only a bed and some furniture. The latter portion of his life was spent more or less in seclusion, and during this time he earned a great reputation by his skill in grinding lenses.

The work of Copernicus, Kepler, and Galileo in the science of astronomy finds a parallel in the work of Spinoza in theology and ethics. If they enlarged men's conception of the immensity of the universe, Spinoza enhanced their idea of God. He removed Him from the petty position which He had held as a local or national Deity, though unfortunately he was so much misunderstood that he was excommunicated from the Synagogue and was cursed by day and night; in sleeping and rising; in going out and in coming in; with all the curses with which Joshua cursed Jericho and Elisha cursed the children. Whatever may be thought about his philosophy, we must allow him credit for giving a practical meaning to the doctrine of the Unity of God, as well as for the introduction of unity into our conception of man and nature. If his doctrine on human freedom does not commend itself to the orthodox theologian, it cannot be denied that he has pointed out the way to the attainment of the highest freedom by which man, no longer a mere part of the phenomenal world, can escape from its limitations and attain true felicity.

#### LITERATURE.

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## CHAPTER VII

### LEIBNITZ AND TRUE FREEDOM

SOMETHING will now be said about the philosophy of Leibnitz (1646–1716), distinguished not only as a philosopher, but also as a mathematician and man of affairs. Descartes had separated things into two heterogeneous substances, connected by the omnipotence of God, and Spinoza had absorbed both into the one divine substance which he identified with God. This doctrine of Spinoza reduced the human mind to a rank which was lower than complete reality, and, to ensure the independence of the soul, Leibnitz developed his doctrine of monads. He held that what we call bodies—material or extended things—are proved by their infinite divisibility not to be real, but merely phenomena or appearance. While some things look material or extended they are not really so in themselves, and actually have the same kind of unity that a soul possesses. He used the word “monad” for the independent spiritual units which make up the scale of existence. The universe is composed of monads—individual centres of force—and no monad has any interaction or causal relation with another monad. To have admitted such dependence would have implied a step in the direction of Spinoza’s one independent being or substance. If anything happens to a monad this is the necessary outcome of its own nature, and the complete mutual independence of the monads is expressed by saying that “they have no windows by which anything can come in or go out.” A difficulty arises when ordinary experience teaches us that things do influence one another, or seem to do so, and Leibnitz admits that the monads behave as if an interaction took place. His theory to explain this apparent interaction—the theory of Pre-established harmony—does not seem to be a great improvement on Occasionalism, which it was intended to supersede. Briefly this theory is as follows.

When God created the universe of an infinite number of monads, each was made to behave in such a way that it was independent of all the others. Each monad is thus a microcosm and, “in imitation of the notion which we have of souls,” must contain something analogous to feeling and appetite. Each succeeding state in a monad is the consequence of the preceding, and, as it is of the nature of each monad to mirror

the universe, it follows that the perceptive content of each monad corresponds with that of every other, though this content is represented with infinitely varying degrees of perfection. To explain why I feel pain when I prick my finger, Leibnitz held that any change in one monad was accompanied by a corresponding change in all the other monads which constitute the universe—a change dictated by the monad. The change in one monad does not *cause* this change in all the others, but is *accompanied* by it, and this doctrine of pre-established harmony proceeds from the nature of the monads as percipient, self-acting beings, not from the arbitrary determination of God. There was no problem for Leibnitz in explaining how the prick in the finger produced a feeling of pain in the mind. The prick does not produce the pain, although it is as if it did. The two are parallel occurrences in two independent centres of spiritual reality.

There is an important distinction between Descartes's and Leibnitz's view of nature—a distinction which may be described as the difference between the mechanical and dynamical aspects. It has already been pointed out that Descartes believed in the constancy of the quantity of motion (momentum) in the universe, but Leibnitz substituted the principle of the conservation of *vis viva*. A considerable amount of controversy arose on this distinction, and was largely due to lack of clear definition of terms. Leibnitz criticized the Cartesian view that the mind can alter the direction of motion, and contended that the quantity of *vis directiva*, estimated between the same parts, is constant. He developed this theory from certain mathematical considerations regarding the resultant of a number of forces acting on a point, but it is not necessary to deal with this view, and we shall now consider the application of his philosophy to the problem of free will. It is important to remember, in this connection, that Leibnitz did not think, as Spinoza did, that philosophy could dispense completely with final causes. He calls the world "the best of all possible worlds," though this does not imply that everything in it, taken by itself, is as good as we can possibly imagine it to be. It does imply, however, that the bad which is in the world could not have been better except in a world which, *on the whole*, would have been worse. Where free agents exist moral evil could not be entirely excluded, but it is better that there should be free agents, although they sometimes commit wrong acts, than that there should not be free agents, for in the latter case there would be no virtue even if there were no vice.

Reverting to the conception of pre-established harmony, this has an important application to the problem of the relation-

ship of mind and body on which something additional will be said. What we call a body is not material, according to Leibnitz, but a group of monads of the less-developed sort. Each higher monad has a group of inferior monads associated with it, and these tend to subordinate themselves to the central soul, *by the law of their nature*. "These principles have given me a way of explaining naturally the union, or rather the mutual agreement, of the soul and the organic body. The soul follows its own laws, and the body likewise follows its own laws; and they agree with each other in virtue of the pre-established harmony between all substances, since they are all representative of one and the same universe." \*

This is expressed in the figure of the clocks which keep exact time together. There are three ways in which this may happen. The first is through a direct mechanical connection—the common (Locke's) theory of mutual influence. The second way is to suppose that a workman regulates them each moment—the theory of the Occasionalists. The third way is to postulate such a skilful construction of the clocks at first that they will always correspond exactly, and this is the way of pre-established harmony. This harmony was a contrivance of the divine knowledge "which from the beginning formed each of these substances in so perfect, so regular and accurate a manner, that by merely following its own laws, which were given to it when it came into being, each substance is yet in harmony with the other, just as if there were a mutual influence between them, or as if God were continually putting His hand upon them."

The reality of the world is, then, the life of a multitude of immaterial things, which, though developing along lines independent of other monads, yet stand in a certain relation to the universal plan. This plan can be summed up in the one ultimate being—the "supreme monad"—God.

Does this pre-established harmony imply predestination and rigid determinism in everything that we do? Are human beings mere automata? Can free will exist in a world where such a régime is accepted? While questions of this kind are awkward for disciples of Leibnitz, they are capable of being answered if only we keep in mind what the universal purpose is. A monad is created with a certain nature and in a certain position, and its life and development consist in unfolding that nature to its true extent. While it is true that the monad changes, these changes are controlled by nothing outside itself, its growth being the unfolding of that nature with which it was endowed at creation. A monad is never promoted in the scale;

\* *Monadology*, 78.

if it were, the pre-established harmony would be thrown into discord. But this fact does not exclude the possibility of change in the same point and in absolute correlation with all other living beings, and development consists in making actual for each monad the possibilities of its own nature. Since thought constitutes its nature, each monad attains its true possibilities by the elimination of confused perceptions, and by the attainment of the true ideas which are hidden in the depths of our primitive experience. It is meaningless to speak of the monads as possessing any purpose, because the only purpose in the universe is that which is displayed by God. A true insight into things as they exist for God constitutes man's real freedom. He is free in so far as he is determined by the law of his own nature, not by something from without, and he is free to realize himself in all his completeness. As confusedness is replaced by clear thought and man understands the reasons for his conduct, this freedom becomes conscious and actual.

The points of agreement between Leibnitz's conception of freedom and Spinoza's conception are obvious from what has been said. Freedom consists in following reason, and servitude in following the passions, and the passions proceed from confused perceptions. Although Leibnitz held that the will is an effort or tendency to that which one finds good, and the end determining the will is pleasure, the word "pleasure" as used by him has nothing in common with egoistic hedonism. Pleasure is the sense of an increase of perfection, and a will which is guided by reason will sacrifice transitory and pursue constant pleasures or happiness. True wisdom consists in this weighing of pleasures.

The philosophy of Leibnitz was systematized by Christian Wolff in a highly rationalistic system and ruled the schools in Germany for nearly a century. The influence of Wolff on Kant will be dealt with in a subsequent chapter.

#### LITERATURE.

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## CHAPTER VIII

### DAVID HUME ON LIBERTY AND NECESSITY

THE history of philosophy is marked by a great controversy between two schools called respectively the "Empiricists" and the "Rationalists." The Empiricists maintained that all our knowledge was derived from experience, and this school is best represented by the British philosophers, Locke, Berkeley, and Hume. The Rationalists are represented by the Continental philosophers of the seventeenth century, especially Descartes and Leibnitz, and this school maintained that, in addition to what we know by experience, there are certain innate ideas and innate principles, and that these are known independently of experience. As this subject is closely associated with questions relating to liberty and necessity, it will be better to deal briefly with certain views on causation which, since the days of Hume, have been given by the Empiricist school of philosophy.

Hume (1711–76) held that causation is only a feeling of expectation due to custom, so that causation becomes entirely subjective. "When any natural object or event is presented, it is impossible for us, by any sagacity or penetration, to discover, or even conjecture, without experience, what event will result from it, or to carry our foresight beyond that object, which is immediately present to the memory and senses." \* He defines a Cause as "an object followed by another, and whose appearance always conveys the thought of that other." In his *Treatise of Human Understanding* he tells us: "What we call a *mind* is nothing but a heap or collection of different perceptions united together by certain relations and supposed, though falsely, to be endowed with a perfect simplicity or identity." From this he infers that there is no absurdity in separating any particular perception from the mind, nor in conjoining an object to the mind. There are, therefore, three essential elements in Hume's doctrine: (1) That reality is only a succession of sensuous impressions; (2) That causation is the idea of invariable succession in our sensations; (3) That causation is derived from repetition in our experiences of individual sequences.

Many writers of the Empiricist school cannot accept Hume's doctrine of causation, especially when they deal with natural science. Hume's conception of reality is incompatible with the

\* *Inquiry Concerning Human Understanding.*

fundamental idea of the existence of a material world, and without a material world natural science is impossible. For this reason modern science could not accept Hume's view that causation is simply a "principle of connection among ideas." Rather it is a connection between events in a material world—a world which in Hume's view dissolves like a dream before our eyes.

We shall now proceed to examine Hume's doctrine of liberty and necessity as adumbrated in *A Treatise of Human Nature*, Book II, Part III.

His definition of *will* is given at the beginning of Section i, "Of Liberty and Necessity," and is as follows: "By the will I mean nothing but the internal impression we feel and are conscious of, when we knowingly give rise to any new notion of our body, or new perception of our mind." He points out that the actions of matter are necessary actions and whatever is on the same footing with matter must also be acknowledged to be necessary. Before inquiring whether this is so with the actions of the mind, he begins with an examination of matter, considering on what the idea of a necessity in its operations is founded.

According to Hume, the ultimate connection of objects is not discoverable either by our senses or by reason, and we can never penetrate sufficiently far into the essence and construction of bodies to perceive the principle on which their mutual influence depends. It is from their constant union, with which we are acquainted, that the necessity arises, and without a uniform and regular conjunction of objects with one another we should never arrive at any idea of cause and effect. Two particulars are considered essential to necessity—the constant union and the inference of the mind—and wherever these are discovered, necessity must be acknowledged. An examination of the course of human affairs shows clearly that men's actions have a constant union with their motives, tempers, and circumstances, and a uniformity and regular operation of natural principles can be seen whether we consider mankind according to the differences of sex, ages, governments, conditions, or methods of education. There is a general course of nature in human actions, as well as in solar operations and in climatic conditions. Even racial traits and individual peculiarities can be known from the observation of uniformity in the actions which emanate from the characters. "This uniformity forms the very essence of necessity."

An opponent could find a pretext for denying this uniformity of human actions and could point to the capriciousness in people's conduct. A moment will often suffice to make a man

change from one extreme to another and to vitiate the good work of years, and in such circumstances how can it be maintained that there is necessity in human conduct? Hume answers this objection as follows: When phenomena are invariably conjoined there is some connection formed in the imagination, but many inferior degrees of probability and of evidence exist, and one contrariety of experiment does not destroy the reasoning. In such cases we conclude that concealed causes exist which are not recognized owing to our imperfect knowledge. The same argument can be used with regard to motives and characters, and we cannot conclude from one irregularity that necessity is not operating in human affairs just as it is in the ordinary phenomena of nature. He gives an example from the conduct of lunatics, who, if we are to judge by their actions, are more erratic than normal men, and hence, if the opponent's argument is to have any weight, "are farther removed from necessity." It is generally admitted, however, that lunatics have no liberty, and this shows the utter inconsistency in the argument as well as the consequences of reasoning with confused ideas and undefined terms.

Hume next proceeds to show that, just as the union between motives and actions has the same constancy as in natural operations, so its influence on the understanding is also the same in *determining* us to infer the existence of one from that of another. He does this by appealing to the force of *moral evidence*, which is really a conclusion concerning men's actions, derived from a consideration of their motives, temper, and situation. The same thing applies to every department of human life. As nothing is of closer interest to us than our own and other people's actions, most of our reasoning is occupied in judgments about them, and when we reason in this way we believe that the actions of the will arise from necessity. "All those objects, of which we call the one *cause* and the other *effect*, consider'd in themselves, are as distinct and separate from each other, as any two things in nature, nor can we ever, by the most accurate survey of them, infer the existence of the one from that of the other. 'Tis only from experience and the observation of their constant union, that we are able to form this inference; and even after all, the inference is nothing but the effects of custom on the imagination. We must not here be content with saying, that the idea of cause and effect arises from objects constantly united; but must affirm, that 'tis the very same with the idea of these objects, that the *necessary connection* is not discovered by a conclusion of the understanding, but is merely a perception of the mind. Wherever, therefore, we observe the same union, and wherever the union

operates in the same manner upon the belief and opinion, we have the ideas of causes and necessity, tho' perhaps we may avoid those expressions. Motion in one body in all past instances, that have fallen under our observations, is follow'd upon impulse by motion in another. 'Tis impossible for the mind to penetrate farther. From this constant union it *forms* the idea of cause and effect, and by its influence *feels* the necessity. As there is the same constancy, and the same influence in what we call moral evidence, I ask no more. What remains can only be a dispute of words."

An illustration of the fact that natural and moral evidence are of the same nature and are derived from the same principles follows. A prisoner without money or interest realizes the impossibility of escape not only from the walls and bars which surround him, but also from the obstinacy of the gaoler. On the scaffold the same prisoner foresees his death just as certainly from the fidelity of the guards as from the operation of the axe or wheel. A connected chain of natural causes and voluntary actions is as follows: The refusal of the soldiers to consent to his escape; the action of the executioner; the separation of the head and the body; bleeding, convulsive motions, and death. The mind feels no difference between these natural cases and voluntary actions in passing from one link to another, and is affected the same whether the united objects be motives, volitions and actions, or figure and motion. According to Hume's definitions, necessity makes an essential part of causation, for which reason liberty is the same as chance, because liberty, by removing the necessity, removes also causes.

In Section ii he gives three reasons for the prevalence of the doctrine of liberty. The first reason is that men find it difficult to persuade themselves after they have performed any act that they were governed by necessity, the idea of necessity seeming to imply something in the nature of force, violence, and constraint, of which they are unaware. Few people are capable of distinguishing between liberty of *spontaneity* and liberty of *indifference*—that is, between that which is opposed to violence and that which means a negation of necessity and causes. The first is commonly accepted as the meaning of the word, and, as it is only that form of liberty which we are concerned to preserve, our thoughts have generally turned towards it and have confused it with the other.

The second reason is that, even of the liberty of indifference, there is a false sensation or experience which is regarded as an argument for the actual existence of liberty. Men feel that their actions are subject to their will on most occasions, and they imagine that the will is subject to nothing. If anyone should



deny their freedom of will they feel that it moves easily every way, as they can show to their own satisfaction. In these cases, however, the sole motive of the actions is the desire to show their liberty, and the bonds of necessity are still in evidence. Although men may imagine that they feel a liberty within themselves, a spectator can usually infer their actions from their motives and character. In cases where he is unable to do so he believes that he might if he were perfectly acquainted with all the circumstances of their situation, temper, etc.; and this is the very essence of necessity. The third reason is due to the influence of religion. A common but reprehensible procedure for refuting a hypothesis in philosophical debate is to show its danger to religion, and this has been a favourite method for attacking the doctrine of necessity. Hume shows that this doctrine, far from militating against religion, actually benefits it. His argument is briefly summarized in what follows.

He defines necessity in two ways, placing it either in the constant union and conjunction of like objects, or in the inference of the mind from the one to the other. In both these senses necessity has been generally allowed to belong to the will of man; no one can deny that we can draw inferences concerning human actions, and that such inferences are based upon the experienced union of like actions with motives and circumstances. Hume does not ascribe to the will that unintelligible necessity which is supposed to be inherent in matter, but he ascribes to matter that intelligible quality—call it necessity or not—which is allowed to belong to the will. Now, this kind of necessity is essential to religion and morality, and on any other supposition both human and divine laws could not exist. Human laws are based on rewards and punishments, and it is considered a fundamental principle that these motives act both as incentives to good and deterrents from evil. Whatever name we may wish to give this influence, considering that it is usually associated with the action, it must be regarded as a cause and an instance of necessity. The argument is equally valid when applied to divine laws, whether the Deity is regarded as acting in a magisterial capacity or as the avenger of crimes on account of their odiousness. Without the necessary connection of cause and effect in human actions it is impossible to think that punishment could be inflicted consistent with justice and moral equity. If we accept the doctrine of liberty or chance, men are no more accountable for deeds which are premeditated than they are for those that are casual and accidental. In this case a man is not responsible for the action, because it did not proceed from any thing that is constant in his nature, and for this reason he should not be punished for it.

The hypothesis of liberty would lead to the conclusion that a man is as untainted after he has committed the most horrid crime as he was at birth, and his character is in no way concerned in his action. " 'Tis only upon the principle of necessity, that a person acquires any merit or demerit from his actions, however the common opinion may incline to the contrary."

The first and second volumes of the *Treatise*, containing Book I, "Of the Understanding," and Book II, "Of the Passions," were published in 1739, but twenty-four years previously Anthony Collins had taken a foremost place as a defender of Necessitarianism. His *Inquiry Concerning Human Liberty* is on similar lines to Hume's method of reasoning, and marshals in a very clear and concise form all the chief arguments supporting the theory. Like Hume, Collins was a Freethinker, and in an earlier work, *A Discourse of Freethinking, occasioned by the Rise and Growth of a Sect called Freethinkers*, he impugned the trustworthiness of the text of Scripture. It need not occasion much surprise that the two Freethinkers should independently pursue a similar line of reasoning. One point in Collins's work is worth noticing—his assertion that it is self-evident that nothing that has a beginning can be without a cause. Dr. Samuel Clarke, a celebrated philosopher and divine, who maintained that freedom of the will was essential to religion and morality, attacked Collins's position, but no reply was made by Collins until the year of Clarke's death, 1729, when he published a reply, *Liberty and Necessity*. It would imply an examination of endless controversies in theology if this work dealt with the views of the various divines who were interested in the subject of Necessitarianism, and it would serve no useful object to pursue this line of thought. Reference should, however, be made to Jonathan Edwards (1703–58), an American metaphysician and divine whose views on necessity were promulgated in the interests of strict orthodoxy, and also to the famous Bishop Joseph Butler.

The basis of Edwards's whole system is the "sovereignty of God," though, on his own confession, he could never give any account of his reasons for arriving at this view. He attempted to justify his conviction by a logical process which would scarcely convince the theologian in modern times. In its original form Calvinism was founded on extreme statements regarding God's sovereignty and man's depravity by nature, but the conclusions from such assumptions were set forth by Edwards in a form as thorough in their logical completeness as they were repulsive. He attempts to exonerate God from the responsibility of the utter depravity which characterizes every one at birth. Adam was originally possessed of two

principles—the natural, or the “flesh” as it is called in the Scriptures, and the supernatural or the divine nature. When Adam ate of the forbidden fruit the divine nature was withdrawn from him, and as a consequence he was left with the “natural” principle. His nature thus became corrupt, but *God did not infuse any evil thing into it*. Edwards’s fame rests chiefly on his treatise on *The Freedom of the Human Will*, and, though he anticipates Hume in certain points, he did not read Hume until his work was published. Evidently he was not greatly impressed by Hume, because, speaking of him and other writers, he says: “I am glad of an opportunity to read such corrupt books, especially when written by men of considerable genius, that I may have an idea of the notions which prevail in our country.”

Edwards defines the will as that by which the “mind chooses anything,” and by “determining the will” he means “causing that the act of the will or choice should be thus and not otherwise.” In answer to the question, “What determines the will?”, he says: “It is that motive which as it stands in the view of the mind is the strongest.” Liberty does not belong to the will itself, but to the person, and the liberty possessed by anyone is only liberty to act as he chooses. Three suppositions are implied by any other form of liberty. The first is that there is a self-determining power in the will. The second is that previous to the act of volition the mind is in a state of equilibrium. The third—“Contingence”—implies that events are not necessarily connected with their causes. He shows that these suppositions are absurd, and so, to his own satisfaction, demonstrates the untenable position adopted by the Libertarians. He endeavours to reconcile his theory of the will with the views which he held regarding moral agency, but this cannot be described as a successful effort. The same remark applies to his attempts to establish the necessitarian position, in spite of his cold and definite precision and his rigorous logical “proofs.”

It will not be necessary to say very much on the views of Bishop Butler (1692–1752), one of the greatest intellectual powers in the Church of England during the eighteenth century. His best-known book, *The Analogy of Religion, Natural and Revealed, to the Course and Constitution of Nature*, is not a philosophy of religion, but an apologetic work which had considerable influence in the Deistical controversy. He assumes that there is an intelligent Author and Governor of Nature, and while his reasoning is an example of strength in analogical argument, it must be admitted that it is also an example of weakness. It is incapable of yielding anything more than a

certain degree of probability, though Butler's caution and fairness of mind will be denied by very few. He argues that it is just as difficult to believe that Nature proceeded from and is ruled by God as it is to concede that Christianity has a divine origin. Most of the Deists admitted a divine Author of Nature, and hence this line of reasoning against them had a certain cogency. As a weapon against present-day scepticism, which does not necessarily accept some of Butler's fundamental assumptions, it is utterly useless, and a modern apologist would find it difficult to sustain an argument intended to prove that the God of Nature is also the God of Revelation.

In Chapter VI of the *Analogy*, "Of the Opinion of Necessity, considered as influencing Practice," Butler argues that the view of fatalism or necessity is not necessarily opposed to religion, or rather that the absurd supposition of universal necessity must be reconcilable to a theological system if it is reconcilable to the facts of experience. It will suffice to point out that this statement of the problem involves two contradictory theories. Universal necessity renders fatalism impossible because fatalism assumes what necessity excludes—the existence of an arbitrary element in the universe. The hypothesis of a fate which determines certain points in the chain of events and does not determine the intermediate points also is absurd and opposed to the doctrine of necessity. He throws little or no light on the real problem, and he deals chiefly with the relation between Necessity and religion. In a practical sense he alleges that Atheistical men pretend to satisfy and encourage themselves in vice, and justify to others their disregard of religion, when they accept the doctrine of necessity. In addition, the doctrine is a contradiction to the whole constitution of nature and to our own experience. Nevertheless, if necessity could be reconciled with the constitution of things and with our own experience, this does not imply that it could not also be reconciled with religion. Unfortunately Butler has rendered very little assistance with the problem.\*

\* A critical examination of Butler's argument appears in Leslie Stephen's *History of English Thought in the Eighteenth Century*, Vol. I, Chapter V.

## CHAPTER IX

### KANT'S DOCTRINE OF FREE WILL

THE great German thinker, Immanuel Kant (1724–1804), is best known through his system of philosophy, though he wrote numerous treatises on other subjects, including natural science and theology. In his *Allgemeine Natur—Geschichte und Theorie des Himmels*, published anonymously in 1755, he has important speculations on the nebular hypothesis, though in certain respects he was anticipated here by J. Wright of Durham. Among his other works reference may be made to those dealing with retardation in the rotation of the earth, owing to the action of the moon in raising tides, the causes of earthquakes, theory of winds, volcanoes in the moon, physical geography, and with other subjects. Some of his writings on theology involved him in difficulties with the Government. This is not surprising when it is remembered that the tendency of his philosophy was towards a moral Rationalism which could not be reconciled with the teachings of the Lutheran Church. After the first part of his book, *On Religion within the Limits of Reason Alone*, had appeared in the *Berlin Journal*, the publication of the remainder was forbidden. The work was published later in full in Königsberg—an act which severely restricted Kant's future activities in lecturing and writing, though the death in 1797 of the King, Frederick William II, exonerated him from the promise which had been exacted from him, not to write or lecture on religious subjects. In Kant's earlier writings it is possible to trace the various stages through which he passed from the notions of philosophy prior to his days to those new methods which characterize his critical philosophy. Reference has been made in the previous chapter to Wolff's systematization of Leibnitz's philosophy, but Kant was not satisfied with certain parts of the Wolffian system. Thus, he held that the Leibnitz-Wolffian philosophy had assigned an erroneous point of view to the investigations into the nature and origin of our cognitions. This system regarded the distinction between the sensuous and the intellectual as logical, but Kant held that it was transcendental. It must be admitted that it is extremely difficult to give a short statement of Kant's philosophy without incurring the risk of conveying an utterly erroneous conception. He has been badly misunderstood

and sometimes quoted in support of views to which his philosophical system gave no sanction. As one instance of this reference may be made to Ernst Haeckel, who cites Kant's views on free will in *The Riddle of the Universe*, Chapter VI, "The Nature of the Soul," but obviously Haeckel misunderstood some of Kant's doctrine. This will be dealt with later when Haeckel's views are considered (see Chapter XI). In the present chapter a brief account will be given of Kant's system, especially that part of it which is relevant to the problem of free will.

We have already seen that Hume had dissolved the reality of the world into a number of unrelated sensations, and these together composed the human mind. In such a scheme it was difficult to see how the mind was competent to apprehend the nature of things as they are in themselves, and Kant was not satisfied with such a position. He held that philosophy should cease to be *dogmatic* and should become *critical*—in other words, before pronouncing what is true or otherwise, it should carry out an inquiry into our intellectual faculties to see how far they are capable of apprehending the real nature of things. He gave the title "critical" philosophy to his system, and to each of his three \* chief works the title *Critique* was prefixed—the criticism of some intellectual faculty.

An examination of Hume's system convinced Kant that his position was untenable. He held that, in addition to the contribution to experience which comes from outside the experiencing subject, there must be something which the subject himself contributes—the direction into intelligible channels of the material which has been provided by experience. One term is employed by Kant which is very important and to which some space will be devoted by way of explanation—the term *synthetic*. A synthetic judgment adds to our conceptions of the subject a predicate not contained in it, and which no analysis could ever have discovered therein. On the other hand, an analytical judgment adds in the predicate nothing to the conception of the subject. It merely analyses it into its constituent conceptions, which were thought already in the subject, though in a confused manner. As an example, take the proposition: "All bodies are extended." This is an analytical judgment because it is unnecessary to go beyond the conception of body to discover that extension is connected with it. It is only necessary to analyse the conception or become aware of the various properties which I think in that conception, to discover "extended" in it. On the other hand, when I say, "All bodies are heavy," the predicate is something

\* These are: *Critique of Pure Reason*; *Critique of Practical Reason*; *Critique of Judgment*.

entirely different from that which I think in the mere conception of a body. The addition of such a predicate therefore produces a synthetic judgment.

Judgments of experience are always synthetical; it would obviously be absurd to ground an analytical judgment on experience, because in forming such a judgment it is not necessary to go outside the sphere of my conceptions. Mathematical judgments are always synthetical—a fact which seems to have escaped previous analysts of the human mind—and proper mathematical propositions are always judgments *à priori*, and not empirical. This is because they carry along with them the conception of necessity, and this cannot be given by experience. The Science of Natural Philosophy (Physics) contains in itself synthetical judgments *à priori* as principles. As an instance, take the proposition: “In all changes of the material world, the quantity of matter remains unchanged.” In the conception of matter I do not think of its permanency, but only its presence in space which it fills, and hence I go out of and beyond the conception of matter to think on to it something *à priori*, which I did not think in it. The proposition is, therefore, synthetical, and yet conceived *à priori*, and the same is true with regard to other propositions of the pure part of natural philosophy. Metaphysics also, though it may be regarded as only an attempted science, nevertheless, from the nature of human reason, must contain synthetical propositions *à priori*. Metaphysicians should avail themselves of such principles as add something to the original conception, and by means of synthetical judgments *à priori*, leave the limits of experience far behind.

The great problem of pure reason is contained in the question, “How are synthetical judgments *à priori* possible?” On the solution of this problem, or upon sufficient proof of the impossibility of such judgments, depends the existence or downfall of the science of metaphysics. Although Hume, among all philosophers, came nearest to this problem, he stopped short at the synthetical proposition of the connection of an effect with its cause, and insisted that such a proposition *à priori* was impossible. “According to his conclusions, then, all that we term metaphysical science is a mere delusion, arising from the fancied insight of reason into that which is in truth borrowed from experience, and to which habit has given the appearance of necessity. Against this assertion, destructive to all pure philosophy, he would have been guarded, had he had our problem before his eyes in its universality. For he would then have perceived that, according to his own argument, there likewise could not be any pure mathematical science, which

assuredly cannot exist without synthetical propositions *à priori*—an absurdity from which his good understanding must have saved him.” \*

Kant’s definition of *à priori* knowledge must be carefully considered, otherwise his position is liable to be misunderstood. He points out that, while all our knowledge begins with experience, it does not follow that it all originates *from* experience. It is possible that experience is made up of two elements, one received through impressions of sense, the other supplied from itself *by our faculty of knowledge on occasion of those impressions*. It is therefore important to investigate the problem as to whether there is knowledge which is independent of experience, and even of all impressions of sense. “Knowledge of this kind is called *à priori*, in contradistinction to empirical knowledge, which has its source *à posteriori*—that is, in experience. But the expression ‘*à priori*’ is not as yet definite enough adequately to indicate the whole meaning of the question above stated. For, in speaking of knowledge which has its source in experience, we are wont to say, that this or that may be known *à priori*, because we do not derive this knowledge immediately from experience, but from a general rule, which, however, we have itself borrowed from experience. Thus, if a man undermined his house, we say, ‘he might know *à priori* that it would have fallen’; that is, he needed not to have waited for the experience that it did actually fall. But still, *à priori*, he could not have known even this much. For, that bodies are heavy, and, consequently, that they fall when their supports are taken away, must have been known to him previously, by means of experience.

“By the term ‘knowledge *à priori*,’ therefore, we shall in the sequel understand, not such as is independent of this or that kind of experience, but such as is absolutely so of *all* experience. Opposed to this is empirical knowledge, or that which is possible only *à posteriori*, that is, through experience. Knowledge *à priori* is either pure or impure. Pure knowledge *à priori* is that in which no empirical element is mixed up. For example, the proposition, ‘Every change has a cause,’ is a proposition *à priori*, but impure, because change is a conception which can only be derived from experience.” †

What criterion exists by which we shall distinguish a pure from an empirical cognition? If we have a proposition containing the idea of necessity in its very conception, it is judgment *à priori*, and, in addition, if it is not derived from any other proposition, unless from one equally involving the idea of

\* *Critique of Pure Reason* (translated by J. M. D. Meiklejohn), pp. 12–13.

† *Ibid.*, p. 1.



necessity, it is absolutely *à priori*. Also, if a judgment carries with it strict and absolute universality, it is not derived from experience, but is valid absolutely *à priori*. It has already been pointed out that the human intellect is in possession of certain judgments which are pure *à priori*, as in the case of mathematics. Indeed, it is unnecessary to search for examples of principles existing *à priori* in cognition, because such principles are the indispensable basis of the possibility of experience itself, for which reason they prove their existence *à priori*. If all the rules on which experience depends were merely empirical, and so fortuitous, from whence could our experience acquire certainty? It may be accepted, therefore, that we possess and exercise a faculty of pure *à priori* cognition, and that the tests for such cognition are universality and necessity.

We can now return to the question: "How are necessary judgments possible?" As has been already shown, there are two elements in our experience—the sense material to which Hume had reduced all the conscious life, and, in addition, certain relating activities of the mind. "The effect of an object upon the faculty of representation, so far as we are affected by the said object, is sensation. That sort of intuition which relates to an object by means of sensation, is called an empirical intuition. The undetermined object of an empirical intuition is called *phænomenon*. That which in the *phænomenon* corresponds to the sensation, I term its *matter*; but that which affects that the content of the *phænomenon* can be arranged under certain relations, I call its *form*. But that in which our sensations are merely arranged, and by which they are susceptible of assuming a certain form, cannot be itself sensation. It is then, the matter of all *phænomena* that is given to us *à posteriori*; the form must lie ready *à priori* for them in the mind and consequently can be regarded separately from all sensation." \*

Kant applies the term *transcendental* to knowledge which is occupied, not so much with objects, *as with the mode of our cognition of these objects*, so far as this mode of cognition is possible *à priori*. In the transcendental meaning of the word he calls all representatives *pure* wherein nothing is met with that belongs to sensation. We find, then, the pure forms of sensuous intuitions in general existing in the mind *à priori*, in which "all the manifold content of the *phænomenal* world is arranged and viewed under certain relations." He calls this pure form of sensibility *pure intuition*. For instance, take away from the representation of a body everything that the understanding thinks as belonging to it, substance, force, etc., and

\* *Critique of Pure Reason*, "Transcendental *Æsthetic*. Introductory."

also all that belongs to sensation, hardness, colour, etc.: there still remains something from this empirical intuition—namely, extension and shape—and these belong to pure intuition, which exists *à priori* in the mind merely as a form of sensibility, without any real object of the senses or any sensation.

In the transcendental sphere, where we derive no guidance or instruction from experience, there lie the investigations of *Reason*. Kant attaches so high a value to these investigations that he persists in following them out, even at the risk of error, and neither doubt nor disregard nor indifference is able to deter him from this purpose. The unavoidable problems of mere pure reason are God, Freedom (of will), and Immortality, and Metaphysics has for its especial object the solution of these problems. It undertakes this task quite confidently, without any previous investigations on the ability or otherwise of reason to perform the work and attain a solution. Indeed, in virtue of its own nature, our reason is incapable of solving the above problem, and this eliminates the possibility of the various proofs which had been proposed for the existence of God. Kant believed that all these “proofs” ultimately devolved upon one—the Ontological Argument—and this he shows to be fallacious. The fact that we cannot think a thing to be otherwise is no guarantee, according to Kant, that the thing is thus apart from our thinking. We have no reason to suppose that things are in themselves as they must appear to us, owing to the constitution of our faculties; indeed, it would be a remarkable coincidence if they were what they appear to be. Now, although all proofs of God, immortality, and freedom are necessarily fallacious, it is also true that all disproofs must also be fallacious. In Kant’s time these were the chief articles of Natural Religion, but, as they did not lie within the sphere of knowledge, they could be removed to that of faith. By faith Kant meant holding something as true on grounds which were sufficient to act upon, but such grounds would not fully satisfy our intelligence. Why should Kant think that these were sufficient grounds to act upon for holding it true that there was a God, that we were immortal, and that our wills were free? It will be sufficient to deal with the last point—the chief object of our inquiry.

The natural law that everything which happens must have a cause, and that the causality of this cause must have a phenomenal cause, so that all events are empirically determined in an order of nature, is a law of the understanding, to which no exception can be admitted. Allowing the existence, then, of natural necessity in the world of phenomena, is it possible to consider an effect as at the same time an effect of nature

and an effect of freedom? It is important to bear in mind that no phenomenal cause can absolutely and of itself begin a series; a *primal* action—in other words, an action which forms an absolute beginning—is beyond the causal power of phenomena.

“Now, is it absolutely necessary that, granting that all effects are phænomena, the causality of the cause of these effects must also be a phænomenon, and belong to the empirical world? Is it not rather possible that, although every effect in the phænomenal world must be connected with an empirical cause, according to the universal law of nature, *this empirical causality may be itself the effect of a non-empirical and intelligible causality—its connection with natural causes remaining nevertheless intact?* Such a causality would be considered, in reference to phænomena, as the primal action of a cause, which is in so far, therefore, not phænomenal, but, by reason of this faculty or power, intelligible; although it must, at the same time, as a link in the chain of nature, be regarded as belonging to the sensuous world.”\* (Attention is drawn specially to the words in italics, not in the text, which are relevant for the point under discussion.)

In brief, it is quite conceivable that an act may be strictly necessary *as a phenomenon*, but, as it enters into the noumenal world, it is really self-determined and free. While the possibility of freedom is not excluded, have we any reasons for believing that it actually exists? To this question Kant replies “Yes,” and his reason for doing so is that freedom must be postulated in order that the demands of the moral law should be satisfied.

In nature the understanding knows nothing except that which is, or has been, or will be. It would be absurd to say that anything in nature *ought* to be other than it is in the relations of time in which it stands—in fact, just as absurd as to ask what ought to be the properties of a circle. But the idea of an *ought* indicates a possible action, the ground of which is a pure conception, and this action must be possible under physical conditions, if it is prescribed by the moral imperative *ought*. Kant deals with this question in *A Critique of Practical Reason*, which is concerned with the human will or “practical reason.” It is practical reason in so far as, being characteristically human, not merely instinctive as with the animals, it always wills to do something with an end in view. A distinguishing mark of a morally good action is that it is freed from every trace of personal interest. The whole essence of a moral life consists in obedience to a law—the Categorical Imperative—a law which commands, not hypothetically, but unconditionally. This law is stated in

\* *Critique of Pure Reason*, Book II, Chap. III, pp. 336–7.

his *Metaphysics of Morals*, Section ii—"Act only on that maxim (or principle) which thou canst at the same time will to become a universal law."

As an illustration of this universal law Kant takes the case of breaking promises. It is wrong to break a promise, because such an action could not become a universal principle. If it did, promises would cease to be made, and in these circumstances they could not be broken. Hence, as it would be impossible for everyone to break a promise, it must be wrong for anyone. In fact, the essence of wrongdoing consists in making an exception. The fundamental principle of moral conduct is, therefore: So act that you can also will that your action should become a universal law. Now such a moral law demands the actuality of freedom and is utterly meaningless unless I can do what I ought to do. As part of the phænomenal world, it is true that my act is not free, and for this reason there must be another and a noumenal realm where the freedom demanded by the moral law exists. Kant thus escapes from determinism, not by denying a causal explanation to empirical acts, but by denying the ultimate reality of that whole world where causality rules. There is the intelligible world also, which, it is true, we cannot know; but which we are compelled to postulate. "The explanation of the possibility of categorical imperatives, then, is that the idea of freedom makes me a member of the intelligible world. Were I a member of no other world, all my actions *would* as a matter of fact always conform to the autonomy of the will. But as I perceive myself to be also a member of the world of sense, I can say only that my actions *ought* to conform to the autonomy of the will." \*

The realization of the claims of the moral law, and not knowledge, is thus the guarantee of the intelligible world, and with the intelligible world postulated to justify freedom and morality, Kant proceeds to show how a practical assurance of God and immortality is made possible. We do not propose dwelling on this argument, nor is it suggested that detailed criticism of his philosophy is possible within the confines of this small work. As is well known, Kant objected to Aristotle's scheme of categories on the ground that it was not confined to forms of the pure understanding, but confused pure and empirical notions, and also omitted some original elements. Kant's categories were intended to be an enumeration of the *à priori* forms of thought and were derived from the forms of logical judgment, but his philosophy broke down because there was a lack of a satisfactory method of discovering the categories. Those who are sufficiently interested to pursue this subject will

\* *Metaphysic of Morality* (Watson's translation), p. 255.

find Caird's *Critical Philosophy of Kant*, especially Book I, Chapter III, very helpful.

Dealing with a more restricted portion of his philosophy—freedom of the human will and the Categorical Imperative—critics have pointed out that the latter is merely a formal principle which is unable to give even a negative guidance. In addition, such a rigorous doctrine can scarcely regard as virtuous conduct which rests on feeling—and it must be admitted that a considerable amount of commendable conduct springs from feeling rather than from the application of reason. The rigour of the doctrine is also shown in its failure to admit exceptions. There are numerous actions in life which are right because they are exceptions, such as heroic self-sacrifice, many instances of which would not be justifiable if everyone performed them. Here we are approaching the realm of ethics, and cannot pursue this particular side of the subject farther.

A summary of Kant's philosophy will be useful in concluding this survey of his work. In the *Critique of Pure Reason* (1781) he contends that the real nature of the world or of mind as they are in themselves is, and must necessarily be, unknown to us. We know them only as they appear to us, but our speculations on what they are in themselves cannot be brought to the test of experience. In his *Critique of Practical Reason* (1788) he holds that we should act as though the inner nature of things were what we had been led to conjecture it to be. This principle should be observed although our actions, when once done, can no longer appear to us as the effects of our own free will—a supposition which we had to make to do them. There was left the possibility of a realm in which the spiritual demands of life, equally with scientific reason, is entitled to induce belief, but there were obvious gaps between the postulates of the spiritual life and the results of reason. Kant tries to meet this problem in the *Critique of Judgment* (1790), in which he refers to certain appearances or phenomena which cannot very well be described apart from the notion of a final cause without which we are unable to *act*. These appearances include first of all the æsthetic experiences, and although we do not think of any particular object served by the beauty of anything, yet we do not think that the beauty was a pure accident, but was produced by some intelligence. However, in such cases there is no justification for attributing beauty to the objects as they exist for the scientific understanding. Indeed, this can often explain the beauty on mechanical principles alone. The other phenomena which we are unable to explain without an end in view are organic beings. Mechanical explanation can go a certain length, but finally something remains—adapta-

tion of parts to the ends of the whole—which is impossible to explain on mechanical principles. In this case also we are only justified in saying that the nature of these objects cannot be explained unless the supposition of design is introduced. We must not assert that the phenomena could not have come into existence in some other way.

The final conception of the Kantian philosophy can be described as that of an ethical teleology, and Kant has summarized it in a very fine passage towards the end of the *Critique of Pure Reason*: “But this systematic unity of ends in this world of intelligences—which, as mere nature, is only a world of sense, but as a system of freedom of volition, may be termed an intelligible, that is, moral world (*regnum gratiæ*)—leads inevitably also to the teleological unity of all things which constitute this great whole, according to universal natural laws,—just as the unity of the former is according to universal and necessary moral laws,—and unites the practical with the speculative reason. The world must be represented as having originated from an idea, if it is to harmonize with that use of reason without which we cannot even consider ourselves as worthy of reason—namely, the moral use, which rests entirely on the idea of the supreme good. Hence the investigation of nature receives a teleological direction, and becomes, in its widest extension, physico-theology. But this, taking its rise in moral order as a unity founded on the essence of freedom, and not accidentally instituted by external command, establishes the teleological view of nature on grounds which must be inseparably connected with the internal possibility of things. This gives rise to a *transcendental theology*, which takes the ideal of the highest ontological perfection as a principle of systematic unity; and this principle connects all things according to universal and necessary natural laws, because all things have their origin in the absolute necessity of the one only Primal Being.” \*

\* P. 494.

## CHAPTER X

### THE VIEWS OF JOHN STUART MILL

THE reader must not expect that this small work will deal with every philosopher, theologian, or scientist who has entered the arena in the controversy between Necessitarians and Libertarians. Reference to a few of the outstanding advocates for each system is all that can be attempted, and in the present chapter something will be said about the views of John Stuart Mill (1806–73). Before examining his doctrine on the freedom of the will, it will be necessary to say something about his views on causation. He adopted the fundamental empiricist position that nothing is given as a basis of knowledge but separate and particular sensations, and that originally these were mere subjective states of feeling. The causes with which he is concerned are not *efficient* but *physical* causes: “They are causes in that sense alone in which one physical fact is said to be the cause of another.” He does not consider that he is called upon to give an opinion on the efficient causes of phenomena or to say if such causes exist. “The Law of Causation, the recognition of which is the main pillar of inductive science, is but the familiar truth that invariability of succession is found by observation to obtain between every fact in nature and some other fact which has preceded it, independently of all considerations respecting the ultimate mode of production of phenomena, and of every other question regarding the nature of ‘things in themselves.’” \*

Mill does not hold that invariable sequence necessarily exists between a consequent and a *single* antecedent. Indeed, the sequence generally subsists between a consequent and the sum of several antecedents, and the concurrence of all of them is necessary to produce the consequent. Philosophically speaking, a cause is the sum total of all the conditions, positive and negative, taken together. The negative conditions may be summed up under the head of “absence of preventing or counteracting causes.” Mill adds that the sequence, in addition to being invariable, must also be unconditional, by which he means what writers imply when they say that “the notion of a cause involves the idea of necessity.” This addition is important because, without it, we might say that day was the cause

\* *A System of Logic*, III, v, § 2.

of night, and night the cause of day. This succession, however, is not necessary; it is conditional on the occurrence of other antecedents. Experience tells us that if the sun were always above the horizon there would be day, but no night, and if below the horizon, there would be night, but no day. Hence we are aware from experience that the succession of night and day is not unconditional.

Mill criticizes the doctrine of the Conservation or Persistence of Force, which was then exercising men's minds, and holds that no new general conception of Causation is introduced by this theory. He then proceeds to examine the ancient doctrine regarding causation—that Mind, or more precisely Will, is the only cause of phenomena. The type of Causation and also the exclusive source from which we derive the idea are our own voluntary agency, and here only, its advocates say, have we direct evidence of causation. In the phenomena of inanimate nature our only direct knowledge is that of antecedent and sequence, but in the case of our voluntary actions we are conscious of power before we have experience of results. In an act of will there is a feeling of energy or force, and this is *à priori* knowledge. For this reason volition cannot be regarded merely as an unconditional antecedent; it is an efficient cause—that is, a cause in an entirely different sense from that in which physical phenomena are said to cause one another. It is a simple step to the further doctrine that volition is the *sole* efficient cause of all phenomena. Writers who uphold this view, while admitting that phenomena may have the semblance of being produced by physical causes, nevertheless maintain that they are actually produced by the immediate agency of Mind. On such a view the earth does not move in accordance with the laws of centrifugal and centripetal forces, but by the direct volition of an Omnipotent Being.

Against such a view Mill maintains that a volition is not an efficient, but simply a physical cause. "Our will causes our bodily actions in the same sense, and in no other, in which cold causes ice, or a spark causes an explosion of gunpowder." It is true that volition and the motion of our limbs in conformity with it are antecedent and consequent, respectively, and both are subjects of consciousness, but the connection between them is a subject of *experience*. Our consciousness of the volition does not contain in itself any *à priori* knowledge that the muscular motion will follow. Assuming that a man's nerves of motion are paralysed or that his muscles are stiff and inflexible, and were in this condition all his life, he would have known nothing about volition as a physical power, unless others told him. He contends that no positive evidence has ever been produced to show



that the power of our will to move our bodies could be known to us independently of experience. How then are we to meet the objection that the production of physical events by a will seems to carry its own explanation with it, while the action of matter on matter seems to require something else to explain it? Mill holds that those who argue in this way rest their case on an appeal to the inherent laws of our conceptive faculty, mistaking for the laws of that faculty its acquired habits, "grounded on the spontaneous tendencies of its uncultured state." The mind has a natural tendency to attempt to facilitate its conception of unfamiliar acts by assimilating them to others which are familiar. Now our voluntary acts are the most familiar to us of all cases of causation, and in the infancy and early youth of the human race they are spontaneously taken as the type of causation in general. In these circumstances all phenomena are supposed to be produced by the will of some sentient being. It is only necessary to remember the aptitude of primitive races for attributing understanding and active power to inanimate objects to appreciate this point of view. Mill quotes a lengthy passage from Reid's \* *Essays on the Active Powers* (Essay IV, Chapter 3) to support his thesis, and the last portion of this is reproduced:—

"As philosophy advances, life and activity in natural objects retires, and leaves them dead and inactive. Instead of moving voluntarily, we find them to be moved necessarily; instead of acting, we find them to be acted upon; and Nature appears as one great machine, where one wheel is turned by another, that by a third; and how far this necessary succession may reach, the philosopher does not know."

We are now in a position to consider Mill's views on the question of the law of causality in its application to human actions. His definition of philosophical necessity is given in his work previously referred to and is as follows:—

"That, given the motives which are present to an individual's mind, and given likewise the character and disposition of the individual, the manner in which he will act might be unerringly inferred; that if we knew the person thoroughly, and knew all the inducements which are acting upon him, we could foretell his conduct with as much certainty as we can predict any physical event. This proposition I take to be a

\* Thomas Reid (1710–96), a metaphysician and divine, was the chief founder of what is generally known as the Scottish school of philosophy. The key to his system is to be found in his revulsions from Hume's sceptical conclusions. His reply to Hume appeared in 1764 in a work with the title, *Enquiry into the Human Mind on the Principles of Common Sense*. His *Essays on the Active Powers of the Human Mind*, quoted by Mill, appeared in 1788.

mere interpretation of universal experience, a statement in words of what everyone is internally convinced of. No one who believed that he knew thoroughly the circumstances of any case, and the characters of the different persons concerned, would hesitate to foretell how all of them would act. . . . The religious metaphysicians who have asserted the freedom of the will have always maintained it to be consistent with divine foreknowledge of our actions; and if with divine, then with any other foreknowledge. We may be free, and yet another may have reason to be perfectly certain what use we shall make of our freedom. It is not, therefore, the doctrine that our volitions and actions are invariable consequents of our antecedent states of mind, that is either contradicted by our consciousness or felt to be degrading." \*

Mill points out that mere constancy of succession does not appear to many people to be a sufficiently strong bond of union for so peculiar a relation as that of cause and effect, and that the imagination retains a feeling of some mysterious constraint exercised by the antecedent over the consequent. When this is applied to the human will it revolts our feelings because we are certain that this mysterious constraint does not exist in the case of our volitions. We feel that if we wished to prove that we possessed the power to resist a motive, we could do so, and it would be paralysing to our desire of excellence if we thought otherwise. (It should be noticed that the wish referred to is a new antecedent.) The best philosophical authorities, however, do not believe that any mysterious compulsion is exercised by any other cause over its effect. If any think that causes draw their effects after them by a mystical tie, then they are quite justified in believing that the relation between volitions and their antecedents is of a different nature. Now if such a tie is considered to be involved in the word "necessity," the doctrine is not true of human actions; but then it is not true of inanimate objects. Indeed, it would be more correct to say that matter is not bound by necessity than to say that mind is bound by necessity.

Mill shows that the use of the word "necessity" is inappropriate inasmuch as it implies much more than mere uniformity of sequence; it implies also irresistibility. The word has another meaning, and a simple illustration shows how confusion has arisen. If we say that all human actions take place of necessity, we mean that they will happen *if nothing prevents*. If, however, we say that death for lack of food or air is a necessity, we mean that death will certainly take place, *whatever may be done to prevent it*. The same term has been

\* *A System of Logic*, VI, i, § 2.

applied to agencies of nature which are uncontrollable—i.e., death if food or air is unobtainable—and to agencies on which human actions depend, and this has created a feeling of uncontrollableness in the latter case also. Mill shows that this is a mere illusion. While certain physical sequences are called necessary, an example of which has already been given, others which are just as much cases of causation are not said to be necessary, as death from poison, which can be averted on some occasions by the use of an antidote. Human actions are regarded by Mill as coming under the last category; except in the case of some forms of mania, they are never ruled by any one motive with such absolute sway that there is no room for the influence of any other. “The causes, therefore, on which action depends are never uncontrollable, and any given effect is only necessary provided that the causes tending to produce it are not controlled.”

It is important to notice the difference between the doctrine of necessity and fatalism. The true Necessitarian doctrine teaches that whatever is about to happen *will be the infallible result of the causes which produce it*, but a Fatalist believes that, in addition to this, it is useless to struggle against it, because it will happen however we may strive to prevent it. Unfortunately, some Necessitarians, believing that their actions follow from their characters, and their characters from their organization, education, and circumstances, are apt to be fatalists in their actions. In the words of the Owenites,\* character is formed *for* a man, not *by* him, and so he has no power to alter it. The fallacy here is that, while character is formed by circumstances, a man's desire to mould it in a particular way *is one of the circumstances*, and not the least influential. It is true that a man cannot directly will to be different from what he is, but it is equally true that those who were supposed to have formed his character did not directly will that he should be what he is. Rather they willed the requisite means, and just in the same way, a man can will the requisite means for himself, and alter, provided his habits are not too inveterate. “We are exactly as capable of making our own character, *if we will*, as others are of making it for us.”

The Owenite can object to these words, “if we will,” because he maintains that they surrender the whole point. If the will to alter our character is given to us, not by our own efforts, but by circumstances outside our control, then it must come to us from external causes or not at all. Mill meets this objection as follows: Admittedly the Owenite has a strong case if he stops short with the above objection, but the question arises: How

\* See Note at end of chapter.

does the wish originate which induces us to attempt the formation of our character? It does not arise as a rule by our organization, nor entirely as the result of our education, but by *experience*—experience of a painful nature regarding the past consequences of our character, or by a feeling of aspiration accidentally aroused. To think that we have no power to alter our character is very different from thinking that we shall not use our power unless we desire to do so, and the effect on the mind is entirely different. If a person does not wish to alter his character he cannot feel very discouraged at the thought that he is unable to make the alteration. The depressing effect of the Fatalist doctrine can be felt only when we have the wish to do what this doctrine represents as impossible. It is of little importance what we think forms our character, if we have no desire of our own about forming it. On the other hand, it is of very great importance that we should not think the attainment impracticable, which would prevent us from forming such a desire.

An examination of the problem convinces us, Mill maintains, that the feeling of being able to modify our own character, *if we wish*, is itself the feeling of moral freedom. If we are to render our consciousness of freedom complete, it is necessary that we should have succeeded in making our character all that we have hitherto attempted to make it. Indeed, if we have wished and not attained, to that extent we have not power over our character, and so are not free.

In conclusion, Mill shows that a motive does not always mean the anticipation of a pleasure or a pain. He does not inquire whether voluntary actions in the commencement were mere means consciously employed to obtain some pleasure or avoid some pain. The fact remains that, through the influence of association, we gradually come to desire the means without thinking of the end, and the action itself becomes an object of desire. It may be remarked that Mill was an exponent of the doctrine of Psychological Hedonism—the theory that the ultimate object of desire is pleasure. In his *Utilitarianism* he says: “Human nature is so constituted as to desire nothing which is not either a part of happiness or a means of happiness” (p. 58). A discussion of ethical systems is outside our scope, and we offer no criticism of Mill’s utilitarian doctrine. Dr. Sidgwick, in his *Methods of Ethics*, and others \* have pointed out the fallacies in it.

This chapter started with an account of Mill’s doctrine of causation, and it will end with a brief criticism of his views. He regards causation as invariable sequence between

\* See Mackenzie, *A Manual of Ethics*.

phenomena, but, as was pointed out at the beginning of the chapter, he holds that a cause usually exists between a consequent and the sum of several antecedents. In addition to the sequence being invariable, it must be unconditional, but it is difficult to reconcile these positions. First of all, consider his statement that cause is the invariable antecedent. How does this agree with the doctrine of Plurality of Causes, which asserts that one fact may be the consequent in several invariable sequences? We cannot very well speak of the invariable antecedent of a phenomenon in these circumstances. Rather we should say that the phenomenon was the invariable consequent of an indefinite number of antecedent conditions. Not only does the definition of Cause come into conflict with the doctrine of the Plurality of Causes, but the latter is inconsistent with Mill's conception of causation as unconditioned sequence. If, as Mill tells us, a sequence is absolutely independent of all other things, then each set of conditions should produce only one precise effect, and no two different sets of conditions could produce exactly the same effect. It is difficult to see how he maintained the doctrine of Plurality of Causes in these circumstances. Those who are anxious to pursue the subject farther should consult works on Logic,\* which show the weaknesses of Mill's method of induction, containing so many inconsistencies. Pure empiricism has proved itself a very helpless means for the attainment of knowledge.

#### *Note on the Owenites.*

The Owenites were called after Robert Owen, the great philanthropist and the founder of English Socialism. His work in improving the conditions of the employees in his factory is too well known to need repeating. When he was quite young he lost all belief in the prevailing forms of religion, and he thought out his own creed, which he considered to be entirely original. He was convinced that a man's character was made *for* him, not *by* him, being formed by circumstances for which he was not responsible. For this reason he did not think that a person should be praised or blamed, and the secret in the formation of character is to place people under proper influences—physical, moral, social—from their earliest years. His principles are embodied in his first work, *A New View of Society, or Essays on the Principle of the Formation of the Human Character*. The testimony of all who visited his factory

\* See, for instance, Sigwart, *Logic*, Eng. trans., Vol. II; Welton, *A Manual of Logic*, Vol. II.

at New Lanark shows the wonderfully good results achieved by Owen. Unfortunately his communistic experiments were not so successful, and some of them lasted for only a very short time. His altruistic schemes, in which he spent most of his means, were frustrated by a factor which perhaps he minimized—the problem of human nature.

The reference to the Owenites by Mill is connected with the view that a man's character is made by his conditions, and improvement in character will automatically follow a changed environment.

## CHAPTER XI.

### PROF. ERNST HAECKEL AND THE FREEDOM OF THE WILL

HAECKEL does not require any introduction to the reader. His writings are well known, and have been produced in a cheap form which has made them accessible to a very wide circle of readers. He must be allowed the credit of popularizing Darwinism with the German public, in spite of a certain amount of opposition, but we can scarcely give him credit for the humility of mind which characterized Charles Darwin. It is probable that many of Haeckel's views were accepted because of the self-confident manner in which he expounded them, though it must be admitted that his lifelong studies on Natural Science, more particularly in the realm of Biology, fitted him to make authoritative pronouncements in this sphere. Some who have re-read his works to-day have possibly formed the opinion which the present writer has formed—that Haeckel would have been well advised if it had been suggested that his writings should have been confined to the realm of Biology. When he has made incursions into other departments he has sometimes betrayed an arrogant spirit and a lack of good taste, and some of his critics have been equally unfortunate in their examination of his views. While it is difficult for many people to exercise moderation in attacking an opponent, especially if their opponent has been guilty of scoffing at certain tenets which are very sacred to them, it is doubtful if much good is done to the cause of knowledge and progress by such methods. If the present writer were called upon to criticize Haeckel's doctrine *in extenso*, he would be obliged to admit a considerable amount that was valid in many of his views (some of which might have been expressed with more courtesy), and also to admit that much of his teaching is quite untenable. The present chapter is restricted to an extremely limited part of his work—his views on the question of the freedom of the human will. These arise incidentally in some of his writings, and quotations will be given from two of these: (1) *The Riddle of the Universe*; (2) *The Evolution of Man*. References to these works will be denoted by (1) and (2) respectively, and the quotations are included under A, B, C, D, E, F.

A. In (1), Chapter I, Haeckel refers to a speech by Emil du

Bois-Reymond, delivered in 1880, in the Leibnitz session of the Berlin Academy of Sciences, in which seven world-enigmas are enumerated. The last of these is the question of the freedom of the will, and of this Haeckel says: "The seventh and last, the freedom of the will, is not an object for critical, scientific inquiry at all, for it is a pure dogma, based on an illusion, and it has no real existence."

B. In the same work, Chapter VI, "The Nature of the Soul," he says: "The dogma of 'free will,' another essential element of the dualistic psychology, is similarly irreconcilable with the universal law of substance."

C. In the same chapter we read: "The most interesting example of such an entire change of objective and subjective psychological opinions is found in the case of the most influential leader of German philosophy, Immanuel Kant. The young, severely *critical* Kant came to the conclusion that the three great buttresses of mysticism—'God, freedom, and immortality'—were untenable in the light of 'pure reason'; the older, *dogmatic* Kant, found that these three great hallucinations were postulates of 'practical reason,' and were, as such, indispensable."

D. In Chapter VII, "Psychic Gradations," he returns to the subject of free will and says: "The importance of the question is also seen in the fact that Kant put it in the same category with the questions of the immortality of the soul and belief in God. He called these three great questions the indispensable 'postulates of practical reason,' though he had already clearly shown them to have no reality whatever in the light of *pure* reason."

Haeckel then points out that some of the teachers of the Christian Church rejected the freedom of the will as decisively as famous leaders of pure Materialism such as Holbach and Büchner.\* He also refers to the deterministic views of Leibnitz and Laplace, and concludes the chapter with the following words:—

E. "The great struggle between the determinist and the indeterminist, between the opponent and the sustainer of the freedom of the will, has ended to-day, after more than 2,000 years, completely in favour of the determinist. The human will has no more freedom than that of the higher animals, from which it differs only in degree, not in kind. In the last century the dogma of liberty was fought with general philosophic and cosmological arguments. The nineteenth century has given us very different weapons for its definitive destruction—the powerful weapons which we find in the arsenal of comparative physiology

\* See Note at end of chapter.



and evolution. We know now that each act of the will is as fatally determined by the organization of the individual and as dependent on the momentary condition of his environment as every other psychic activity. The character of the inclination was determined long ago by *heredity* from parents and ancestors; the determination to each particular act is an instance of *adaptation* to the circumstances of the moment wherein the strongest motive prevails, according to the laws which govern the statics of the emotion. Ontogeny teaches us to understand the evolution of the will in the individual child. Phylogeny reveals to us the historical development of the will within the ranks of our vertebrate ancestors."

F. In (2), Chapter XXX, "Results of Anthropogeny," Haeckel says: "The Monistic or Mechanical philosophy affirms that all the phenomena of human life and of the rest of nature are ruled by fixed and unalterable laws; that there is everywhere a necessary causal connection of phenomena; and that, therefore, the whole knowable universe is a harmonious unity, a *monon*. It says, further, that all phenomena are due solely to mechanical or efficient causes, not to final causes. It does not admit free will in the ordinary sense of the word. In the light of the Monistic philosophy the phenomena that we are wont to regard as the freest and most independent, the expressions of the human will, are subject just as much to rigid laws as any other natural phenomenon. As a matter of fact, impartial and thorough examination of our 'free' volitions shows that they are never really free, but always determined by antecedent factors that can be traced to either heredity or adaptation. We cannot, therefore, admit the conventional distinction between nature and spirit. There is spirit everywhere in nature, and we know of no spirit outside of nature. Hence, also, the common antithesis of natural science and mental or moral science is untenable. Every science, as such, is both natural and mental. That is a firm principle of Monism, which, on its religious side, we may also denominate Pantheism. Man is not above, but in, nature."

We shall examine each of these headings in the next few pages.

A. Haeckel's summary dismissal of the subject is unworthy of an eminent man of science. Even if it is based on an illusion, this is no reason why it is not an object for scientific inquiry. The mirage is an illusion, but no one would contend that it is outside the realm of serious scientific investigation. If this attitude had been adopted we should not know that it was caused by an increase in the density of the atmosphere in ascending from the ground, refraction taking place, and virtual images

of objects which are above the ground being formed. A subject like the freedom of the will, to which philosophers have devoted so much serious thought for thousands of years, cannot be so lightly brushed aside.

B. It is essential that we should have very clear ideas on this "Law of Substance," and an explanation of it appears in (1), Chapter XII. It should be noticed that this very important law includes two supreme laws of different origin and age. The first of these is the chemical law of the "conservation of matter," and the other—the younger law—is the physical law of the "conservation of energy." Haeckel adds: "It will be self-evident to many readers, and it is acknowledged by most of the scientific men of the day, that these two great laws are essentially inseparable."

No fundamental objection need be raised against these two laws, though there have been great developments in chemistry and physics since the days when Haeckel wrote these words. In his time physicists were prepared, on the whole, to accept matter and energy as fundamental factors in the inorganic world, and the conservation of matter as well as the conservation of energy were accepted as important generalizations. It is scarcely necessary to say that a revolution has taken place since then. The subatomic energy which was first observed leaking out very slowly from the atoms of radioactive bodies can, in certain circumstances, surpass by a factor of millions the energy which is produced in the ordinary chemical reactions. The study of such energy and of the conditions which are necessary for its liberation has allowed the physicist to explain the radiation of our sun and other stars. The sun is losing weight at the rate of 250 million tons a minute, and this "annihilation of matter" provides the necessary energy emitted by the sun in the form of light and heat, a minute fraction of which falls upon our earth. Without this all life, so far as we know, would cease to exist. Assuming that matter is being annihilated, or, more correctly, transformed into radiation, the law of the conservation of matter disappears and the conservation of mass and of energy becomes the same thing. In the words of Sir James Jeans: "The two fundamental cornerstones of nineteenth-century physics, the conservation of matter and the conservation of energy, are both abolished, or rather are replaced by the conservation of a single entity which may be matter and energy in turn. Matter and energy cease to be indestructible and become interchangeable. . . ."\*

Haeckel seems to have anticipated the modern physicist in certain respects. In the chapter under discussion he says:

\* *The Universe Around Us*, p. 186.

“The conviction that these two great cosmic theorems, the chemical law of the persistence of matter and the physical law of the persistence of force, are fundamentally one, is of the utmost importance in our monistic system.”

Reverting to B, in which, as we saw, the dogma of free will is irreconcilable with the universal law of substance, according to Haeckel, recent developments in physical science do not contradict his law of substance. Indeed the opposite is the case, for, accepting his view that the two laws “are fundamentally one,” and the view expressed by Sir James Jeans, their meaning is nearly identical. So far, therefore, modern physics tends to support Haeckel’s Monism, but does this Monism prove to be irreconcilable with the dogma of free will? If psychic processes are subject to the law of substance, like other natural phenomena, there is only one answer and that is in the affirmative. Unfortunately Haeckel does not prove that the law of substance prevails in psychic activity. He sees in such activity “a group of vital phenomena which are dependent on a definite material substratum, like all other phenomena.” To this material basis of all psychic activity he gives the name “psychoplasm”—the term being applied because chemical analysis shows it to be a body of the group called protoplasmic bodies, the albuminoid carbon-combinations which are at the root of all vital processes. In the higher animals the “neuroplasm” or nerve material has been differentiated out of psychoplasm, and, as he tells us, his conception in this sense is materialistic. No one will object to a materialistic view so long as consistency is observed, but it is difficult to reconcile his views which have been given above with those expressed in another part of Chapter XII where he lays down three theses as indispensable for a truly monistic view of substance. The first only is quoted, as relevant for our present purpose: “The two fundamental forms of substance, ponderable matter and ether, are not dead, and only moved by extrinsic force, but *they are endowed with sensation and will* (though, naturally, of the lowest grade); they experience an inclination for condensation, a dislike of strain; they strive after the one and struggle against the other.” (I have italicized some words in the quotation which are important.) The leap from matter to mind has been accomplished without the slightest attempt at explanation, and it is difficult to see how Haeckel maintained a materialistic system if he seriously believed that sensation and will were endowments of substance. He has unconsciously allowed himself to fall back on a dualistic system. That this is not an oversight on Haeckel’s part is proved by statements of a similar nature in his book; one more

quotation will suffice to show that he was not a consistent monist. At the end of Chapter I he says: "We adhere firmly to the pure, unequivocal monism of Spinoza; \* Matter, or infinitely-extended substance, and Spirit (or Energy), or sensitive and *thinking substance*, are the two fundamental attributes, or principal properties, of the all-embracing divine essence of the world, the universal substance." (Italics have been inserted.)

C. We shall now examine Haeckel's interpretation of Kant's view on God, freedom, and immortality. Kant's philosophy has been considered in Chapter IX, and we do not propose adding to what has been said there. Kant showed that the critical faculty led by one train of thought to a certain conclusion and by another equally logical train to an entirely different conclusion. In the one case we are led to causality through freedom; in the other case the only causality is that of natural law. Hence Kant required that God, freedom, and immortality should be made postulates of practical reason. We have already shown why he maintained that there were sufficient grounds for holding them true.

D. It is unnecessary to deal with this, as it is merely a repetition of C. In both cases it would have been better if Haeckel had devoted more space to a fuller consideration of Kant's position. The terse manner in which he sums up Kant's views is certainly misleading to those who have little or no knowledge of Kant's philosophy.

E. It is incorrect to say that the struggle has ended. It is equally incorrect to say that the weapons for its definitive destruction are found in the arsenal of "comparative physiology and evolution." What are the "laws which govern the statics of the emotions"? Have ontogeny and phylogeny done all that is claimed for them? These are questions that still await an answer.

F. The question whether the universe is a harmonious unity permitting of no intrusion or action by mind—in other words, a closed system—has been discussed by the present writer.† Haeckel deduces the existence of this harmonious unity from the general principle with which he set out—the Law of Substance. In the work referred to experimental evidence dealing with the reactions of unicellular organisms and higher forms of life

\* It has been shown in Chapter VI that Spinoza's doctrine is based upon spiritualistic monism, which makes God the only real Substance. He manifests Himself under His two attributes of Thought and Extension, but it is certain that Haeckel would not have accepted this interpretation of Spinoza's philosophy which he quotes with approval.

† In *Free Will or Determinism* (Watts & Co., 1937).

has been cited. On the whole it would seem that the weight of evidence is in favour of automatism in the lower organisms, but in higher forms of life the results are often of a contradictory nature. Further reference will be made to some of the outstanding features of research along these lines in the concluding chapters. Meanwhile the reader will probably agree that Haeckel has not established his case—that the freedom of the will is not an object for scientific inquiry, and that the weapons of physiology and evolution have given it the *coup de grâce*. Incidentally it may be remarked that if it is not a subject for scientific inquiry it is remarkable that scientific weapons should be employed in its destruction. Enough has been said on this particular side of the question, and we shall now examine the problem in the light of recent physical research.

#### *Note on Holbach and Büchner*

The system of Holbach, a French writer of the eighteenth century, endeavoured to provide a consistent materialistic view of the world. Holbach regarded man as a product of nature that had gradually developed from a low condition. He did not, however, succeed in solving the problem as to the mode of his genesis and evolution. The question of human development occupied the minds of many, both in and out of France at the time.

Büchner's important work, *Kraft und Stoff*, which ran through many editions since it was first published in 1855, was regarded as a kind of text-book on Materialism. In later editions, after the appearance of Darwin's *Origin of Species* in 1859, Büchner cited Darwinism as the chief supporter of Materialism, and asserted that the two factors which played a prominent part in evolution, according to Darwin—the struggle for life and natural selection—had abolished final causes. There is a remarkable similarity between a large amount of his teaching and that of Haeckel.

## CHAPTER XII

### THE PROBLEM IN THE LIGHT OF RECENT DEVELOPMENTS IN PHYSICS

IN a previous chapter \* we saw that Democritus gave a materialistic view of the universe which held a primary place in philosophical thought. Atoms were supposed to be the ultimate material of all things, spirit included, and to have existed from all eternity. At the end of the last century it was shown that the atom could be broken up, and that the fragments were identical, whatever were the atoms from which these fragments came. As is well known, Rutherford conceived the atom to be built up on lines similar to those we find in the solar system—a heavy central nucleus with electrons whirling around, like the sun and the planets or like a major planet (Jupiter or Saturn) with their satellite systems. Bohr and others extended the picture, which, it must be remembered, is purely figurative, but which possesses the great advantage that it can be easily visualized. The model worked well for a time and was able to correlate various spectroscopic phenomena, but by 1925 it had broken down, and the new wave-mechanics of Schrödinger drew a different picture of atomic interiors.

Sir Arthur Eddington's book, *The Nature of the Physical World*, which appeared in 1928, and which was substantially the course of Gifford Lectures delivered in the University of Edinburgh during the previous year, was in some respects epoch-making. As he pointed out in his chapter on "Causation," physics came down heavily on the side of predestination in the old conflict between free will and predestination. Its moral sympathy had been with the view that the future is foretold in the configurations of the past:—

"Yea, the first Morning of Creation wrote  
What the last Dawn of Reckoning shall read." †

Eddington admits in this chapter that it seemed incredible to think that predetermination should include life and consciousness, but he was unable to form a satisfactory conception of any causal sequence which should be other than deterministic. However, he tells us that his attitude to the question had altered, and, in consequence of the advent of the quantum theory,

\* Chapter II.

† Quoted from Omar Khayyám.

*“physics is no longer pledged to a scheme of deterministic law.”* In rewriting this chapter a year after the lecture was delivered he adopts an attitude more hostile to determinism, and this arose from accepting the Principle of Indeterminacy. This principle, formulated in 1927 by Heisenberg, sometimes called the Principle of Uncertainty, is as follows: “A particle may have position or it may have velocity but it cannot in any exact sense have both.” Sir James Jeans, who is an expert at making extremely abstruse subjects clear to the ordinary man, has given an excellent exposition of this principle. To understand his explanation a word must first of all be said about the orbits of electrons and also about Planck’s Constant.

Electrons are conceived as moving in very definite orbits around the central nucleus, and also as incapable of occupying intermediate positions between one orbit and another. When an electron is excited by heat or electric action or other means it jumps into the next orbit away from the nucleus, and absorbs energy in doing so. Conversely, when it falls back into its original orbit it emits the same quantity of energy. In these jumps the quantity of energy absorbed or emitted is just sufficient to lift an electron from one orbit to another vacant orbit. There is no law to decide how an atom will behave, and it is impossible to predict what particular jump an electron will take at any time. For this reason it has been suggested that the atom is not really subject to any law, but possesses something like “free will”—a view which would rule out predetermined physical laws. For each atom there are a number of characteristic amounts of energy, and these different amounts correspond to the various possible transitions from orbit to orbit. Radiation of each particular wave-length has a certain amount of energy associated with it, and this amount depends on the wave-length, and on nothing else. This energy is called the “quantum,” which is supposed to be proportional to the number of vibrations of the radiation per second. As the number of vibrations a second—the frequency—is inversely proportional to the wave-length of the radiation, the red light, which has long wave-length, has feeble quanta compared with the violet light. If the frequency of the radiation is denoted by  $\nu$ , the quantum of energy is  $h\nu$ , where  $h$  is a universal constant of nature—Planck’s constant. It is obvious that when an atom emits energy which takes the form of a periodic oscillation or wave, if the amount of energy is divided by the number of oscillations per second, the result will be Planck’s constant, and this is known to be  $6.55 \times 10^{-27}$  erg seconds. The quanta of radiation which is emitted or absorbed by an atom are now generally known by the name “photons,” and as these

photons carry various amounts of momentum, depending on the frequencies, it might seem that very accurate information could be obtained by using photons of small momentum. While this is true in theory, in actual practice it raises a serious difficulty. Photons of small momentum have long periods of oscillation, and it is impossible to fix with great precision the instant to which their information refers. As Jeans says: "It is like trying to time a hundred yards race with a grandfather clock that only ticks seconds." \*

Physicists are therefore confronted with the dilemma that one kind of photons, carrying a large amount of energy, give inexact information about the present condition of the universe, while another kind, carrying less energy, are too slow in telling their story when they arrive, and are unable to give precise information about the time. Intermediate types fail, of course, in both ways.

When different kinds of photons are tried it is known, from mathematical considerations, that the product of the two errors in time and space can never be less than a certain minimum. To obtain a complete knowledge of the motion of a particle two data are required—the instant at which it passes a landmark in the apparatus which is used, and the exact velocity at the landmark. If the speed of the particle is measured in terms of its momentum (the product of the mass by the velocity), then it is found that the product of the errors in position and momentum can never be less than  $h$ , Planck's constant. The mass of an electron is  $9 \times 10^{-27}$  grammes, and, as has been already stated,  $h$  is  $6.55 \times 10^{-27}$  erg seconds; hence it is easily seen that the product of the uncertainties in position and speed of an electron is 0.73. As an instance, suppose that it is discovered by means of the flash which it makes on a screen that an electron is within a hundredth of a centimetre of a certain point, then the speed of its motion will be uncertain to at least 73 centimetres (obtained by dividing the constant 0.73 by 0.01) a second. Jeans goes on to show that if we picture the electron in terms of Schrödinger waves, the same principle of uncertainty will follow:

Speaking of the Principle of Indeterminacy Eddington says:† "The future is a combination of the causal influences of the past together with unpredictable elements—unpredictable not merely because it is impracticable to obtain the data of prediction, but because no data connected causally with our experience exist. . . . Those who maintain a deterministic theory of mental activity must do so as the outcome of their study of the mind

\* 7, p. 232. The numbers refer to the works in the list at the end of the chapter,

† 1, pp. 294-5.



itself and not with the idea that they are thereby making it more conformable with our experimental knowledge of the laws of inorganic nature.”

Eddington is convinced that modern physics has become more definitely hostile to the postulate that the future is predetermined, with the discovery of the Principle of Indeterminacy. He gives a simple case where we think we can predict the future.

Let us assume that we have a particle with known position and velocity at the present instant. If we assume that nothing interferes with it, we can predict its position at any subsequent instant, though, strictly speaking, the non-interference would be a subject for another prediction. This is not considered, however, as it would introduce complications into the problem. The Principle of Indeterminacy forbids this simple prediction, because it states that we cannot know accurately both the velocity and the position of a particle at the present instant. It is true that there is no limit to the accuracy with which we may know the position, *provided that we do not also want to know the velocity*, and hence we can determine two very accurate positions with an interval of a second, from which, apparently, the velocity can be found. But this velocity is useless for prediction purposes, because in making the second accurate determination of position, “we have rough-handled the particle so much that it no longer has the velocity we calculated. *It is a purely retrospective velocity.*” \*

Eddington goes on to show that the view that a particle necessarily has a definite velocity now amounts to disguising a piece of the unknown future as an unknowable element of the present. “Classical physics foists a deterministic scheme on us by a trick; it smuggles the unknown future into the present, trusting that we shall not press an inquiry as to whether it has become any more knowable that way.” † This same principle extends to every kind of phenomenon that we attempt to predict, but generally the need for accuracy is buried under a mass of averages.

If there is no causality in the external world, many might consider that this implies an end to all true science, but Eddington does not hold this view. The point which we shall now consider is the effect of this doctrine upon the human will, and on this Eddington says: “A complete determinism of the material universe cannot be divorced from determinism of the mind. . . . Conversely, if we wish to emancipate mind we must to some extent emancipate the material world also.” ‡

Take as an example the prediction of the weather a year ahead. To make this prediction we should require to know

\* 1, pp. 307.

† *Ibid.*, pp. 307–8.

‡ *Ibid.*, p. 310.

not only a lot about present conditions on the earth; it would be necessary to examine the state of the sun to make predictions on its heat and corpuscular activity. Even a complete knowledge about all the physical conditions on the earth, and in its interior—volcanic activity, etc.—and on the sun, would be insufficient, because the human mind can influence the weather. A coal strike may lessen the amount of smoke thrown into the atmosphere and so alter the rainfall, or a lighted match thrown carelessly aside may cause a conflagration of a forest which will alter rainfall and climate. Hence there can be no fully deterministic control of inorganic phenomena unless the determinism governs the mind itself, and conversely. Are there any obstacles to the emancipation of mind? This is the problem with which he deals next.

He does not agree with the Materialist view that the motions of the body and limbs, which appear to be controlled by our volitions, are only reflex actions controlled by the material processes in the brain. The act of will, on the Materialist view, is a mere inessential side phenomenon which occurs simultaneously with the physical phenomena. The Materialist also assumes that the result of applying physical laws to the brain is fully determinate. Eddington adds: "It is meaningless to say that the behaviour of a conscious brain is precisely the same as that of a mechanical brain if the behaviour of a mechanical brain is left undetermined. If the laws of physics are not strictly causal the most that can be said is that the behaviour of the conscious brain is one of the possible behaviours of a mechanical brain. Precisely so; and the decision between the possible behaviours is what we call volition." \*

One more passage will be quoted, and readers will be able to judge whether some of the criticisms of the views expressed are justifiable. Eddington continues: "A mental decision to turn right or left starts one of two alternative sets of impulses along the nerves to the feet. At some brain centre the course of behaviour of certain atoms or elements of the physical world is directly determined for them by the mental decision—or, one may say, the scientific description of that behaviour is the metrical aspect of the decision. It would be a possible though difficult hypothesis to assume that very few atoms (or possibly only one atom) have this direct contact with the conscious decision, and that these few atoms serve as a switch to deflect the material world from one course to the other. But it is physically improbable that each atom has its duty in the brain so precisely allotted that the control of its behaviour would prevail over all possible irregularities of the other atoms.

\* 1., p. 311.

If I have at all rightly understood the processes of my own mind, there is no finicking with individual atoms. . . . It seems that we must attribute to the mind power not only to decide the behaviour of atoms individually but to affect systematically large groups—in fact to tamper with the odds on atomic behaviour. This has always been one of the most dubious points in the theory of the interaction of mind and matter.” \*

Professor H. Levy,† referring to the early part of this quotation, and expressing his disapproval of the views which Eddington has set forth, says that none of his biological friends has heard of these facts. There is a remarkable resemblance between some of the views expressed in the above quotations and those of Descartes, to whom reference was made in a previous chapter. The “trigger action” of the unpredetermined behaviour of a few key atoms in our brain-cells, if established, would simplify the problem, as Eddington points out in a later work,‡ in which he expounds his views in greater detail and answers his critics. In our bodily mechanism there is a large amount of trigger action, as when a minute physical change in a nerve releases the pent-up energy of a muscle. He conjectures that the physical effects of volition have their origin in structures containing many billions of atoms, and if such a unit behaved like an inorganic system of similar mass, there would be sufficient indeterminacy to allow appreciable freedom. Quoting Eddington’s own words: “My own tentative view is that this ‘conscious unit’ does in fact differ from an inorganic system in having a much higher indeterminacy of behaviour—simply because of the unitary nature of that which in reality it represents, namely the Ego.” §

Having accepted the view that the activities of consciousness do not violate the laws of physics, Eddington admits that the nature of responsibility brings us to a dilemma which he, in common with hundreds of others, is unable to solve. Although we feel that we can change our nature to some extent—in other words, we can reform or deteriorate—are we certain that this reforming or deteriorating impulse is not also within our natures? If it is not in us, how can we be responsible for it? He is not prepared to accept the solution sometimes offered that responsibility is a self-contradictory illusion, and responsibility seems to him to be one of the fundamental facts of our nature. As a theory of matter must correspond to our perceptions of matter, “so a theory of the human spirit has to correspond to our inner perception of our spiritual nature.” ||

\* 1, pp. 312–13.  
§ 2, p. 88.

† 9.                      ‡ 2.  
|| 2, p. 90.

It must be pointed out that not all physicists agree with Eddington's point of view, and some of them are out-and-out Determinists in spite of, or even because of, developments in atomic physics. Thus Max Planck holds that the quantum hypothesis will some day find its exact expression in equations which will be a more exact formulation of the laws of causality, and he thinks that this law can be extended to the activities of the human mind. He writes: "The principle of causality must be held to extend even to the highest achievements of the human soul. We must admit that the mind of each one of our greatest geniuses—Aristotle, Kant or Leonardo, Goethe or Beethoven, Dante or Shakespeare—even at the moment of its highest flights of thought or in the most profound inner workings of the soul, was subject to the causal fiat and was the instrument in the hands of an almighty law which governs the world." \*

Einstein supports this view. He says: "I am entirely in agreement with our friend Planck in regard to the stand which he has taken on this principle. He admits the impossibility of applying the causal principle to the inner processes of atomic physics under the present state of affairs; but he has set himself definitely against the thesis that from this *Unbrauchbarkeit* or inapplicability we are to conclude that the process of causation does not exist in external reality. Planck has really not taken up any definite standpoint here. He has only contradicted the emphatic assertions of some quantum theorists and I agree fully with him. And when you mention people who speak of such a thing as free will in nature it is difficult for me to find a suitable reply. . . . Honestly I cannot understand what people mean when they talk about freedom of the human will." †

Those who follow out Planck's arguments may conclude that there are inconsistencies in his position. In Chapter V of the work referred to he says: "The fact is, there is a point, one single point in the immeasurable world of mind and matter, where science, and therefore every causal method of research, is inapplicable, not only on practicable grounds, but also on logical grounds, and will always remain inapplicable. This point is the individual ego. It is a small point in the universal realm of being; but in itself it is a whole world embracing our emotional life, our will, and our thought. This realm of the ego is at once the source of our deepest suffering and at the same time of our highest happiness. Over this realm no outer power of fate can ever have sway, and we lay aside our own control and responsibility over ourselves only with the laying aside of life itself."

\* 8, p. 155.

† 8, p. 210.

Other physicists have adopted an attitude of neutrality on the subject, holding the view that the contribution of modern physics to the problem of free will is nothing. Among these is included Professor Herbert Dingle, an astrophysicist of distinction, whose conclusion, after a most careful examination of the problem, is: If we assume that the behaviour of atoms is not strictly determined, it is useless to argue that as the brain is composed of atoms, therefore the mind is not strictly determined, because consciousness is not derived from atoms.\* Others again have agreed more or less with Eddington, and among these is Weyl, who explains how the limits to determinism, if there are any, will be found by passing along from the large-scale phenomena of astronomy and physics, which necessarily appear to be deterministic, to the small-scale phenomena. He says: "We firmly believe today that we have touched these limits in quantum mechanics. . . ."

"At the same time 'fate' as expressed in the natural laws appears to be so weakened by our analysis that only through misunderstanding can be it placed in opposition to free will."†

Sir James Jeans seems to favour a non-deterministic view, but he is sometimes non-committal in his opinions. He discusses the problem in different places and about nine years ago expressed his views as follows: "Nevertheless, the most we can say is that crevices have begun to appear in what used to be considered the impregnable closed cycle of physical science. Whether the volitions of the human mind can pass through these and affect the operations of nature must in the last resort depend on whether the two are sufficiently alike to interact—a keyhole is useless unless we have a key of the same nature as the lock. It may still be, as Descartes maintained, that mind is too dissimilar from matter ever to be able to influence it."‡

The idealism of Sir Arthur Eddington and also of Sir James Jeans has been attacked on the philosophical side, and the views of certain philosophers have been already considered in another work.§ Since this appeared, in 1937, Dr. L. Susan Stebbing, Professor of Philosophy in the University of London, has entered the arena and has challenged the position of the physicists who doubt or reject physical determinism. She accuses them of misleading theologians, preachers, and even philosophers "who should have known better." Prof. Stebbing alleges that Eddington's lack of philosophical training has made it possible for him to slip into pitfalls that he might other-

\* 12.

† 10, pp. 35, 43.

‡ 7, p. 282.

§ 21, especially Chapter V, which deals with the criticism of C. E. M. Joad and Bertrand Russell.

wise have learnt to avoid. Certain theological problems are dealt with in this interesting work, especially in Chapter X, "Human Freedom and Responsibility." In the last chapter she criticizes Professor Millikan's reasons for his faith in the Christian religion and for his belief that Materialism is now obsolete (the latter based upon the recent discovery that the properties of the atoms are as mysterious as any that used to masquerade under the name of "mind"), and says: "It is odd to find the view that 'all is mysterious' is to be regarded as a sign of hope. The rejection of the 'billiard-ball view' of matter does not warrant the leap to any form of Idealism. Surely a view that finds a place for Mind in the universe only after the principle of uncertainty has been discovered or after abstruse physical speculations have made of physics a science not 'understood of the people' is not a view that should commend itself to the earnest seeker after God, especially if that seeker be a Christian. At least, I should have thought not, were it not that Christian apologists have been eager to wait upon the pronouncements of the physicists, so thankful to be assured that we put into Nature the laws we profess to discover and, finally, that the chairs we sit on are not solid." \*

Prof. Stebbing offers some criticism on the views of Sir James Jeans, especially in his work *The Mysterious Universe*. I have always thought that critics took this work too seriously—perhaps more seriously than the author himself. Many have tried to be facetious about his "mathematical God," but it is unnecessary to regard this expression as anything beyond a "suggestive metaphor." Prof. Stebbing objects, *inter alia*, to his failure to define some of his terms, such as "thought" and "thinking," and adds: "Yet it is upon the concept of *thought* that the whole of his metaphysics depends. Had he been a philosopher either by training or by inclination he would surely have realized the necessity of attempting to analyse a concept so fundamental for his argument." † Readers will probably agree with most of the criticism of his position which has been made in the work referred to, and it may be readily conceded that he has not afforded the common reader very much clear information regarding the philosophical implications of the new physics.

The question of the objective reality of atoms and electrons must be left to the philosophers to discuss. It would very much exceed the allotted space for this work to deal with this side of the question, and the chapter will conclude with a quotation from Einstein in a work published a few years ago: "Science is not just a collection of laws, a catalogue of un-

\* 19, p. 285.

† *Ibid*, p. 25.

related facts. It is a creation of the human mind, with its freely invented ideas and concepts. Physical theories try to form a picture of reality and to establish its connection with the wide world of sense impressions. Thus the only justification for our mental structures is whether and in what way our theories form such a link." \*

#### LITERATURE.

The following list contains a number of the more important works which deal with the subject of the present chapter. Reference is made to some of these in the text.

1. A. S. Eddington, *The Nature of the Physical World.*
2. — *New Pathways in Science.*
3. — *Science and the Unseen World.*
4. — *The Philosophy of Physical Science.*
5. J. Jeans, *The Mysterious Universe.*
6. — *The Universe Around Us.*
7. — *The New Background of Science.*
8. M. Planck, *Where is Science Going?*
9. H. Levy, *The Universe of Science.*
10. H. Weyl, *The Open World.*
11. A. Einstein and Leopold Infeld, *The Evolution of Physics.*
12. H. Dingle, *Science and Human Experience.*
13. — *Through Science to Philosophy.*
14. E. W. Barnes, *Scientific Theory and Religion.*
15. Bertrand Russell, *Outline of Philosophy.*
16. — *The Analysis of Matter.*
17. C. E. M. Joad, *Philosophical Aspects of Modern Science.*
18. — *Guide to Philosophy.*
19. L. Susan Stebbing, *Philosophy and the Physicists.*
20. C. D. Broad, *Determinism, Indeterminism, and Libertarianism.*
21. M. Davidson, *Free Will or Determinism.*

A few of these deal only with atomic physics without considering the question of free will. In 2, Eddington replies to a number of critics (including those dealing with certain philosophical difficulties), Prof. W. T. Stace and Dr. C. E. M. Joad, as well as Bertrand Russell, whose criticism, however, seems to be based on some misunderstandings.

Among the works which are definitely opposed to Eddington's views are 9, 12, 13, 15, 16, 17, 18, 19. In 21 will be found a summary of most of the objections to Eddington.

Criticism of Eddington and also his replies have appeared in different journals, *Nature*, *The Nineteenth Century*, *Contemporary Review*, and elsewhere. In the books listed above practically all that the reader requires on the subject will be found.

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\* 11, p. 310.

## CHAPTER XIII

### THE POINT OF VIEW OF THE BIOLOGIST

THE title of this chapter is slightly misleading, inasmuch as there is no consensus of opinion among biologists on the question of the freedom of the will or determinism. Different schools of thought exist, and probably will exist for some time because of the conflicting nature of experimental evidence. A brief outline of the situation is all that can be attempted in one chapter. The subject has been discussed at length in a previous work \* to which readers desiring further information can refer.

As the question of the transmission of acquired traits is very important, a short survey of Lamarck's work will be undertaken at this stage. Lamarck (1744–1829) believed that spontaneous generation might result from such agencies as heat and electricity acting on small gelatinous bodies, and, with this as a starting-point, he propounded four laws † to explain the organization of animals and also the formation of their various organs. These are:—

“(1). Life by its proper forces tends continually to increase the volume of every body possessing it, and to enlarge its parts, up to a limit which it brings about.

“(2). The production of a new organ in an animal results from the supervention of a new want continuing to make itself felt, and a new movement which this want gives birth to and encourages.

“(3). The development of organs and their force of action are constantly in ratio to the employment of these organs.

“(4). All which has been acquired, laid down, or changed in the organization of individuals in the course of their life is conserved by generation and transmitted to the new individuals which proceed from those which have undergone those changes.”

The second law has been principally associated with the name of Lamarck, and has sometimes been misunderstood. It might appear to imply that an animal's desires have a *direct* effect on its conformations, but what Lamarck actually taught was that altered wants lead to altered habits, and these in turn lead to modifications in old organs as well as to the formation

\* *Free Will or Determinism* (1937), especially Chapters VI, VII, VIII.

† In *Philosophie Zoologique*.



of new ones. An example is given from the giraffe which wanted to reach the foliage on trees, and so stretched its neck to reach it, this stretching finally leading to a long neck. The fourth law implies that acquired traits are transmitted to the offspring; without this law it is obvious that the second law would become ineffective so far as a species was concerned, even if its validity were accepted in the case of an individual. It is interesting to notice that Lamarck's "acquired traits" were not, generally speaking, transmitted unless they were common to both sexes. In discussing this matter he says: "Everything which Nature has caused individuals to acquire or lose by the influence of the circumstances to which their race is long exposed, and consequently by the influence of the predominant employment of such organ, or its constant disuse, she preserves by generation to the new individuals proceeding from them, provided that the changes are common to the two sexes, or to those which have produced these new individuals." \*

Lamarck, like Darwin, taught that the more complex forms of life have simpler ancestors, but he attached the chief importance in the *modus operandi* to the influence of new wants which had an indirect action in stimulating growth and use. Darwin believed that the chief factors in evolution were accidental variations which gave certain advantages to different forms of life in the struggle for existence. It is now accepted that these are insufficient to explain evolution, and other factors must be postulated. The advantage of small variations, such as Darwin thought were operative, is very problematic, and mutations or sudden jumps in the structure of organisms must now be recognized as effective in some cases.

The question of the transmission of acquired traits is of the utmost importance, because, if it is accepted, the main-spring of evolution is the response of an animal to its environment, or, in simple language, acquired habit. The late Prof. E. W. MacBride held this view very strongly and attached great weight to the experiments which seemed to establish Lamarck's views on the transmission of acquired traits. Here we encounter the diversity in the opinions of those who regard the universe as a great closed system with its causal laws which apply to the organic world in the same way in which they apply to the inorganic, and of those who recognize the influence of Mind in everything. MacBride was convinced that evolution is the history of the acquisition of new habits, and that we reach the most fundamental explanation of adaptation which is possible by the assumption that living matter was endowed by the Creator with something that endeavours to meet adverse

\* In *Philosophie Zoologique*.

circumstances. Not only so, but the living matter with such an endowment is able to control its own growth. The recognition of teleological factors in evolution appears a simple matter to some, but there are many who are unable to see anything beyond blind chance in the organic world as in the inorganic.

It is remarkable that this question regarding the transmission of acquired traits or otherwise cannot be settled definitely, and that so much doubt still remains on this subject. Weismann denied that there was such a thing as transmission of acquired traits, and interesting as his Germ-Plasm theory is, there are many who are not prepared to accept his views *in toto*.\* Experiments have led to very perplexing results in some cases, and in others they appear to have produced conclusive evidence—in some cases for and in others against the transmission of acquired traits. An instance can be taken from the work of Dürken on the caterpillars and pupæ of the common cabbage white butterfly. Generally speaking, the pupæ have colours which range from practically pure white to dirty grey, but a small percentage—about 4 per cent. under natural conditions—have no pigment in the skin, and these appear to be bright green in colour because the green blood of the pupa shows through.

From the eggs of butterflies which were living under normal conditions Dürken reared (a) caterpillars in orange light, and as a result he obtained a higher percentage of green pupæ. He selected the green pupæ and utilized the eggs of the butterflies which resulted from them as follows: He reared a number of these eggs in (b) orange light, and these eggs produced a higher percentage of green pupæ than he had previously obtained. Other eggs were reared in (c) bright light and others in (d) darkness, and in each case there resulted a much higher percentage of green pupæ than would be obtained by rearing the wild and unsorted caterpillars in bright light or in darkness. The experiment seems to have established the claim of the Lamarckians that the green colour which the pupæ acquired by the presence of orange light is inherited by a large percentage of the caterpillars.

Other experiments in more recent times appear equally conclusive. W. H. Thorpe describes his experiments with the larvæ of *Nemeritis* and *Drosophila melanogaster* which were

\* Professor R. G. Punnett's remark on certain tendencies of the theory of Weismann is apposite: "But by cutting away the Lamarckian and environmental props and by insisting upon the 'omnipotence' of natural selection in evolutionary change he threw upon this last factor a burden which, in the opinion of many, was too great for it to bear." *Background to Modern Science*, Chapter IX.

reared on certain media (*Proc. Roy. Soc.*, 127, 424–33; 1941). Adults of *D. melanogaster* arising from larvæ reared on media which contained essence of peppermint were not repelled by the smell, as in the case of normal cultures. J. E. Cushing experimented with a pure strain of *Drosophila guttifera* (*Proc. Nat. Acad. Sci.*, 27, 496–99; 1941) which normally inhabits fungus-infested food. Some larvæ were reared on fungus-free and some on fungus-infested media, and the adults which resulted were allowed to choose between these two media for laying their eggs. He found that the conditions under which the larvæ were reared had a decided influence on the choice of the adult.

It should be pointed out, however, that objections can be raised against the conclusions of experiments of this kind. Take the case of Dürken's caterpillars. As the caterpillars do not all respond to the orange light, it is certain that the wild caterpillars are not all genetically homogeneous, some possessing groups of genes in the chromosomes of their germ-cells which are responsive to the orange light, while others have no such genes or, if they have, they are recessive. Obviously from group (a) Dürken segregated the more responsive caterpillars and, as might be expected, the result of this selection would show itself in group (b) as a specially responsive group. The same responsiveness would also be shown in groups (c) and (d). Similar criticism can be made of all experiments with organisms which are not shown conclusively to be *genetically homogeneous at the beginning of the experiments*. Results obtained by experiments on a mixed stock, using an eclectic method for sorting out the mixed material, may appear to prove the inheritance of acquired characters but actually prove nothing.

Experiments conducted on *genetically homogeneous material* have shown that fluctuations are not inherited. When fluctuations occur in a species, individuals will differ in certain characteristics within definite limits (say in size), and it might seem that by selecting large or small individuals it would be possible to obtain a giant or dwarf race. Johannsen experimented with scarlet-runner beans which reproduce by self-fertilization. The beans which come from a pure line obtained by this self-fertilization differ in size, but the difference from the mean corresponds merely to the curve of probability and lies within well-defined limits. Johannsen used the descendants of a particular bean and found that no difference in size resulted whether he sowed the large or the small beans. The distribution of size was the same whatever selection process was employed to obtain them. Jennings did similar work with the *paramecium*, the well-known "slipper-animalcule" of our

ponds. While specimens varied in length, it was impossible, by any process of selection, to produce a long or a short breed of this organism. Agar's work with *simocephalus*, a water-flea which produces itself parthenogenetically, led to the same results, or perhaps proved the opposite. The eggs developed parthenogenetically produced specimens with longer and shorter carapaces, and the latter, far from producing offspring with short carapaces, produced them with longer carapaces!

It must be pointed out, however, that environment, including food, exercise, etc., can and does affect a species *within the limits in which a population can naturally fluctuate*. As Morgan \* says, "Selection cannot cause a group (species) to transcend the extreme variations that it naturally shows. Rigorous selection can bring a population to a point where all of the individuals are nearer to the extreme type shown by the original population, but beyond this it cannot go."

Morgan's own experiments on *drosophila* are worth recording, as they are an additional illustration of the danger of making false inferences. He obtained a mutant stock of *drosophila* in which the eyes were small and sometimes absent. After several generations he found that the flies which were hatched tended to have eyes, and even increasingly large eyes. It would seem, then, that these flies which were bred in the stock-bottles had some inward urge for light, and eyes developed in response to this urge. Unfortunately additional experiments did not support this view. When these late-hatched flies with eyes were mated to unrelated wild stock and the mutant type extracted from the offspring by inbreeding, flies of the eyeless type again appeared.

The explanation depends on the fact that the original culture was variable in its genetic composition. In the stock-bottles there was a certain amount of competition for existence and the flies were successful in cases where their genetic qualities modified the violence of the eyeless mutation. By a process of gradual selection of these modifying factors flies were produced in which the eyes improved, in spite of the fact that the flies still contained the mutant eyeless gene unaltered.

While Morgan's experiments appear at first to support Lamarck's Second Law, enunciated at the beginning of this chapter, it will be seen that the production of the new organ is not connected with the supervention of a new want, as Lamarck believed.

Other evidence is equally unsatisfactory. Thus, while McDougall found that rats, which received an electric shock on landing from a tank at a light, transmitted the knowledge so

\* T. H. Morgan, *The Theory of the Gene*, p. 289.

acquired to their progeny, Koltsova was convinced that the capacity of rats to find their way through a maze was not improved after many generations. MacBride attached great importance to Kammerer's work on salamanders, which seemed to prove conclusively that acquired traits were transmitted, but it was discovered later that Kammerer's assistant deceived him, and the results were valueless. An experiment which was conducted by MacBride himself is worth noticing. He took a number of stick insects which fed on privet and by a process of starvation induced them to feed on ivy. He then found that successive generations descended from the ivy-feeding insects learned the lesson of feeding from the ivy more quickly. Here again, disturbing factors are possible, and further research is desirable before drawing definite conclusions. From their experience of life most people would admit that the transmission of such traits as mutilations is extremely rare, if indeed it ever occurs. In cases where it does apparently happen it is important to inquire into the past history of the individual; the "acquired trait" may be genetic, and this is not always easy to find out. Incidentally it may be pointed out that a time will come when our male descendants will find it unnecessary to shave, if mutilations can be transmitted!

The remark made by Professor J. B. S. Haldane about ten years ago is apposite in this connection. He pointed out that man, on the whole, was induced by society to behave better than he would do if left to his own devices, and on Lamarckian principles he should improve innately in each generation, but no evidence for such an improvement is apparent.\* These words are worth pondering; Haldane uses the expression "on the whole," and we are forced to ask whether society does not often produce deterioration. In any case, recent events have corroborated his view—by no means original—and signs of ethical progress and enhanced principles of humanity are sadly lacking.

Leaving the question of the transmission of acquired traits (the evidence on the whole seems to be against the theory), we shall now look at the problem of the freedom of the will from another point of view. It is well known that the lower organisms display interesting reactions to various tropisms—in other words, response to a stimulus. An example of the influence of light on the regenerating polyps of *Eudendrium* is given in the results of experiments carried out by Loeb and Ewald. The intensity of the light was changed by varying the distance of its source from the polyps, and the times required

\* *The Causes of Evolution*, p. 130.

by 50 per cent. of these to bend towards the source were determined. It was found that there was a remarkable correlation between the results and the well-known Bunsen-Roscoe law.\* This law states that the photochemical effect of light is a function of the intensity of the light and of the duration of the illumination. Many other experiments with different forms of stimuli have been carried out, but these are too numerous to mention. It will be sufficient to state the conclusions at which Loeb and his colleagues arrived as a result of their experiments.

A stimulus acts upon the animal's sense-organs, and through these on the organs of locomotion, in consequence of which the animal turns until its body is symmetrically stimulated and equilibrium is established between the two sides. *These movements occur mechanically, as a result of physical and chemical changes in the various organs, with no real effort on the part of the organism.* Loeb attempted to extend his conceptions of tropic actions to comprise all animals, man included, but, as might be expected, this was impossible.† It is difficult to imagine a tropic creature, say an intelligent euglena, experimenting with other euglenæ to find out if they were tropic too, and it is equally difficult to imagine a human being, assuming for the moment that he is tropic, experimenting on other human beings or on himself, to discover their exact tropic reactions.

How far do other forms of life differ from the low unicellular organisms which are almost certainly tropic? Pavlov's experiments with dogs are interesting and throw some light on this question. He gave dogs some tempting food and measured the flow of saliva which resulted from this "unconditioned reflex." He then accompanied the sight of the tempting food by some other stimulus, and it was found that, after a time, this stimulus, the "conditioned reflex," produced the effects which had been previously produced by the sight of food. Having thus produced a reflex by a signal, the ringing of a bell, etc., Pavlov proceeded to inhibit this conditioned reflex by unpleasant results, such as disagreeable acids, and this ended in the animal suffering from neurasthenia or becoming hysterical. Here there is conclusive evidence that the response to a conditioned reflex can be the same as that to an unconditioned reflex, the stimulus in the former being something which the animal has learned to associate with the original experience.

What has usually been considered voluntary behaviour has thus been reduced by Pavlov to something approaching scientific law, but how far such methods are applicable to human actions

\* Schwarzschild's law is a little more accurate.

† See reference to Loeb's works at the end of the chapter.

is a problem which has not yet been settled. If, as seems probable from the experiments with dogs, the behaviour of these animals is not necessarily related to teleological ends, does the same thing apply to human beings? The behaviourist psychology, which has its experimental basis very largely in the work of Pavlov, does not deny the existence of mind, but denies its efficacy. Its object, as stated by a leading exponent, Dr. John B. Watson, is the "ascertaining of such data and laws that, given the stimulus, psychology can predict what the response will be; or, on the other hand, given the response, it can specify the nature of the effective stimulus." This short survey of the question of the reaction of organisms to tropisms, stimuli, etc., leads on to a consideration of the mechanical view of life. This will be dealt with in the remainder of this chapter.

A purely mechanical view of life is, as might be expected, associated with Materialism. Many definitions of this word have been given, but it will be sufficient to accept one of them for the present purpose, and that given by the late Prof. J. S. Haldane will be used: "Materialism may be defined as the belief that physico-chemical realism, or the assumption that the representation of our surrounding universe by the physical sciences in their traditional form corresponds to reality, can be extended so as to cover, not only the phenomena of life, but also those of conscious behaviour." \*

Haldane was convinced that many of the phenomena associated with life were inexplicable on mere mechanical principles. Thus, the tendency of an animal organism to maintain its internal and external environment constant was one of those inexplicable phenomena on the materialistic hypothesis. He did not, however, accept the vitalistic hypothesis, and he simply accepted life as a fact for which an explanation was impossible. "Life as simply life is the reality which must be assumed in biological interpretation; and the word 'life' is indispensable for denoting what we find." † This seems a remarkable attitude for an eminent man of science because it discourages further inquiry into one of the greatest problems which have presented themselves in the whole universe of science. Some may even consider that it is merely an attempt to evade the issue and to avoid too close a scrutiny into the point of view of the advocates of the mechanist conception of life. Probably the same remark would apply to a number of theories which are nothing more than mere *ad hoc* postulates to conceal our ignorance, and among these many would feel disposed to include such doctrines as Bergson's *élan vital*, Smuts's *Holism*,

\* *Materialism*, in "Preface."

† *Ibid.*, p. 50.

Lloyd Morgan's *Emergent Evolution*, etc., but there is no space to deal with these, and the chapter will close with some further considerations of the mechanistic view.

Two of the chief exponents of the mechanistic theory of life are Dr. L. J. Henderson and Dr. J. Needham, though in certain points they differ in their conceptions. As opposed to the view of J. B. Haldane on the balancing of environment, it is argued that it is unnecessary to postulate an outside influence because well-known principles in physics and chemistry are able to afford at least a tentative explanation of this. Thus, Le Chatelier's principle in thermodynamics—"when a factor determining the equilibrium of a system is altered, the system tends to change so as to oppose and partially annul the alteration in the factor"—may include, as a special case, the tendency of an organism to maintain a constant environment. Then the argument that we are abstracting from reality if we regard an animal as a physico-chemical system, ignoring the fact that it is a psycho-physical whole, is shown by Needham to be invalid. If such an argument were carried out consistently it would tend to encourage the method of the mystic and to deny that there is any validity in the scientific method. Whatever may be said against the mechanistic hypotheses, at least they do provide theories which can be proved or disproved, and very little stimulus towards research is produced by some of the views which postulate an outside influence. The words of Bertrand Russell in this connection are worth pondering: "Is the human body a mere machine, governed wholly by the principles of physics and chemistry? Wherever it is understood, it is found to be so, but there are still processes which are not completely understood; perhaps in them a vital principle will be found to be lurking? In this way, the champions of vitalism become the friends of ignorance. Let us not, they feel, know too much about the human body, lest we should discover to our dismay that we can understand it. Every fresh discovery makes this view less plausible, and restricts the territory still open to the obscurantist." \*

While readers may disagree with some parts of this quotation, it must be pointed out that vitalism has retreated from one position to another, and when the operations of vitalism are limited to entelechy—that is, to some non-mechanical agent which works in psycho-physical systems—its case is weakened. The word "entelechy" is derived from the Greek *enteles*, "attained perfection," and *echo*, "to have," and means the complete actualization of a thing. Leibnitz called his monads *entelechies* (borrowing the Aristotelian term) because they

\* *The Scientific Outlook*, p. 48.



have a certain perfection. Many biochemists find it difficult to entertain any intelligible conception in the word, and Needham's description is interesting as well as amusing. He describes it as follows: "A directive force which is neither matter nor spirit, which can act but at the same time cannot think, and which regulates chemical processes perfectly capable of regulating themselves, seems thoroughly inconceivable to the biochemist."

The subject of mechanism should be considered in connection with the remarkable results obtained by Loeb and others in artificial fertilization. The eggs of a certain Californian sea-urchin, which cannot be fertilized in ordinary sea-water by the sperm of star-fish, can be fertilized if the water is a little more alkaline, or if a small amount of calcium is added to it. The larvæ were not quite normal; they possessed only maternal traits, and a mere small percentage lived long enough to form skeletons. Similar results were obtained with other species, but perhaps the most remarkable experiments were those connected with artificial parthenogenesis. These were conducted with the eggs of the sea-urchin *Arbacia* and the Californian sea-urchin, *Strongylocentrotus purpuratus*, as well as with the eggs of frogs. Guyer injected lymph into unfertilized eggs of frogs and obtained free-swimming tadpoles. Bataillon was able to produce the same effect by merely puncturing the eggs, and Loeb, on repeating the experiment, caused the eggs to develop into frogs which were identical with ordinary frogs, except that they were smaller, and were always males. It is impossible to refer to all the experiments which have been conducted on these and similar lines, and the reader will find a list of works at the end of the chapter which can be consulted if he is sufficiently interested in the subject. The relevance of the various positions which have been adopted regarding problems of vital activity will be obvious. If the influence of some outward force is recognized—Mind—the position of the Determinist becomes precarious. If, on the other hand, the phenomena of life and growth can be included in the whole scheme of the universe as subject to the usual causal laws, it is difficult to see how advocates of free will can maintain their position.

The influence of Mind naturally raises the problem of teleology in the universe. Are teleological factors in evidence, or have the old views received their *coup de grâce* as a result of recent developments in different branches of science? The words of Lawrence Henderson are worth quoting in this connection, though they may come as a shock to some: "Science has put the old teleology to death. Its disembodied spirit, freed from

vitalism and all material ties, immortal, alone, lives on, and from such a ghost science has nothing to fear.” \* This opinion is held by others besides men of science; the philosopher too finds it difficult to accept the old teleological views, and those who are anxious to pursue the subject should read Professor John Laird’s Gifford Lectures which have recently appeared in two volumes,† and which show the futility of the old arguments for design, considered from the point of view of the philosopher. It should be pointed out that the question of values arises in dealing with teleology, and here the moralist and theologian are confronted by most perplexing problems. One example will suffice to show how difficult it is to attribute any sense of values to Mind, assuming that it is active in the universe. This is merely one out of numerous instances.

It is well known that malaria is conveyed by the female gnat *anopheles*, which acts as a carrier of the parasite. Close behind her stabbing style there is a small tube like a hollow needle which leads from a poison-gland and which injects a drop of juice into the stabbed wound. Not only does this juice make the blood-vessels flush and bring more blood for the *anopheles* to imbibe, it also prevents clotting of the blood, and thus assists the sporozoites of *plasmodium*, the microscopic parasite of malaria which swarms especially in the poison-gland near the head, to enter the circulation of the bitten person. These feed upon the red corpuscles of the blood, and when they have eaten out the contents they split up into families of young, which in turn enter the red cells and repeat the process. Inside the red corpuscles they are safe from the attacks of the white corpuscles, which are ready to pounce upon any intruders and to devour them in ordinary circumstances. The white corpuscles never attack the red cells, and so the parasite is free to continue its onslaught in the home which it quickly ruins.

The parasite’s preparation for sexual reproduction and the method which Nature (if we may personify nature for the present) adopts to ensure that this takes place are interesting, though it must be admitted that there seems something utterly revolting about them, regarded from the point of view of human beings. After a time the parasite in each red cell turns into an immature sexual form-male or female, but instead of bursting the eaten-out cell, the *plasmodium* waits for a favourable opportunity. Two sexual cells, immature and isolated in red cells which they have eaten out, are incapable of conjugation unless brought together, and the *anopheles* comes to their assistance. The gnat bites the sufferer, and the blood which she sucks

\* *Fitness of the Environment.*

† *Theism and Cosmology ; Mind and Deity.*

contains the parasites which are immaturesly developed sexually. It is remarkable that they are not digested by the gnat, but prepare for conjugation, one rounding itself into an egg and the other protruding a few lashing tails which ultimately break off and fertilize the ova. These then become pointed at one end and find their way towards the wall of the gnat's stomach. After a time each of these cysts bursts, and hundreds of cells, let loose in the gnat's blood, swarm, especially in the poison-gland, ready to infect human beings again.

It is unnecessary to dwell on the ravages which are effected by this parasite. In India alone it is estimated that over a million people die annually from malaria, and a fairly large percentage of the earth's human population is infected. The parasite has adapted itself to kill others, but it is doubtful if it has reason, recognition, or choice. It is possible that its whole phase is performed by some chemotatic principle, at least one hopes so, because if it acts in accordance with some Design running through the universe, many would feel disposed to say: "So much the worse for Design." Of course if we are prepared to concede that values are non-existent or that the *anopheles* or the *plasmodium* has equal value with human beings, we might admit Design, but what a Design! The following quotation from a comparatively recent work is apposite in connection with this subject. Speaking of the competition between life and life the author says:

"An element deepening this conflict is that Nature has evolved kinds of life whose specific food consists of lives adjunct to developed mind. This obviously continues, heedless of mind, what prevails in the mindless competition between lives where one life battens on another. It suggests that Nature holds mind at a discount; perhaps she is so fertile that she can afford to. Developed mind as agent of predacity always offers the paradox that 'zest to live' develops as its corollary 'zest to kill.' It demonstrates life condemned to live by spreading pain and death around it. Whatever meaning the evolution of life and mind may have, mind, so soon as it develops, is plunged into the thick of life as conflict. Where the predatory life and its quarry both possess developed mind the struggle leaves a trail of suffering. The predatory life which so lives is a seed of suffering on the planet's side. Nature contains much which is hateful and much of pain. Much 'that spoils the singing of the nightingale.' " \*

The problem which still awaits solution is the origin of life and, while recent discoveries have narrowed the issues

\* Sir Charles Sherrington, O.M., *Man on his Nature*, The Gifford Lectures, Edinburgh, 1937-8; p. 379.

regarding the spontaneous origin of life, because they point to the conclusion that this can occur only under very restricted conditions, much still remains to be done. It is difficult to define the exact qualities which separate the living from the non-living. Reproduction, irritability, and movement were once the chief criteria, but they cannot now be accepted without certain qualifications. There is scarcely any doubt that the study of the viruses will continue to throw additional light on the problem and probably in the near future will be able to solve it completely. The virus-particle is the most minute separate life which is known, and it easily passes through the pores of a filter which is capable of stopping the smallest bacteria. A parasite on other life, it lives by turning the protein of its host into its own protein—in other words, it lives by enzymes. It has been shown quite recently that tobacco mosaic viruses have a width of about 6 ten-millionths of an inch and length seven or eight times as much and that the particles have an internal regularity similar to that of crystals. The virus seems to be composed of piles of sub-molecules with dimensions less than cubes 5 hundred-millionths of an inch in the length of each side. Their internal regularity, their lack of water, and also their chemical simplicity separate these viruses most sharply from the simplest recognized organisms.\* The virus seems to be on the border-line between the most complex of non-living phenomena and the smallest living entity (it must be credited with belonging to the latter class), and a very fertile field of research by X-ray analysis still awaits fuller exploration. Perhaps the conditions for the spontaneous development of "life" will be discovered soon, but this is only speculation. We know something about the evolution of our planet during the last three thousand million years and we cannot ignore the probability that the exact conditions for the development of life by certain chemical processes existed for many millions of years. Some day these conditions may be reproduced in the laboratory and the mystery that has baffled the human mind will be a mystery no longer. To quote again from Sherrington: "Chemistry and physics account for so much that the cell does, and for so much to which years ago physical science could at that time offer no clue, that it is justifiable to suppose that the still unexplained residue of the cell's behaviour will prove resolvable by chemistry and physics." †

\* See *J. Gen. Physiol.*, 25, 111-65 (1941). Three papers by Prof. J. D. Bernal and Dr. I. Fankuchen.

† *Ibid.*, p. 135.

## LITERATURE.

The literature on the subject of this chapter covers such a wide scope that reference can be made only to the more outstanding works. In the list below readers will find different points of view, and attention is specially drawn to the research of Driesch and others on the cleavage cells of the sea-urchin. Driesch postulated an "entelechy" to explain certain peculiarities. See the present author's comments on these results in *Free Will or Determinism*, Chapter VII.

A. Weismann, *The Germ Plasm Theory*.

E. W. MacBride, in *Zoology*, p. 261.

— *Evolution in the Light of Modern Knowledge*.

— Also in *The Great Design, Order and Progress in Nature* (edited by Francis Mason), "Study of Heredity."

On the transmission of acquired traits:—

*Brit. Journ. Psych.*, April 1927, January 1930, October 1933, October 1935.

A. Dendy, *Outlines of Evolutionary Biology*, *Journ. Exp. Zool.*, 46, 301.

Marcus S. Pembrey, *Evolution in the Light of Modern Knowledge*, especially the Chapter "Physiology."

J. B. S. Haldane, *The Causes of Evolution*.

— *New Paths in Genetics*.

J. C. Willis, *Age and Area*.

H. G. Wells, Julian Huxley, G. P. Wells, *The Science of Life*.

J. A. Thomson and Patrick Geddes, *Outlines of General Biology*.

J. Graham Kerr, *Evolution*.

J. S. Haldane, *Materialism*.

— *The Sciences and Philosophy*.

J. Arthur Thomson, *Concerning Evolution*.

C. E. M. Joad, *Mind and Matter*, especially Chapter IV.

C. Lloyd Morgan, *Emergent Evolution*.

— *Life, Mind, and Spirit*.

Henri Bergson, *Creative Evolution*.

J. C. Smuts, *Holism and Evolution*.

F. Younghusband, *The Living Universe*.

W. McDougall, *Religion and the Sciences of Life*.

— *Modern Materialism and Emergent Evolution*.

— *Body and Mind: An Outline of Psychology*.

A. N. Alexander, *Space, Time, and Deity*.

L. J. Henderson, *Fitness of the Environment*.

J. Needham, *Man a Machine*. See also his summary in *Science, Religion, and Reality*.

Peter Chalmers Mitchell, *Materialism and Vitalism in Biology*.

Among the works which deal with experiments on animals the following will be useful:—

H. Driesch, *The Science and Philosophy of the Organism*. Also his paper in *Arch. f. Entwicklungsmeck*, 1902, XIV, 500.

Jacques Loeb, *The Organism as a Whole*.

—— *Artificial Parthenogenesis and Fertilization*.

—— *Dynamics of Living Matter*.

Theodore H. Savory, *Mechanistic Biology and Animal Behaviour*.

H. Horsley Gantt, *Lectures on Conditioned Reflexes*, translated from the Russian, dealing with Pavlov's experiments. Also G. V. Anrep's translation, *Conditioned Reflexes*.

On Behaviourism, John B. Watson, *Psychology from the Standpoint of a Behaviorist*.

## CHAPTER XIV

### CONCLUSION

IN the preceding chapters I have attempted to present an outline of the controversy between those who have advocated a deterministic system in the Universe, this system including in many cases the actions of human beings, and those who have maintained that the Universe is not a closed system. The arguments have been briefly summarized and readers have been left to judge for themselves, though it is fairly certain that many will find it extremely difficult to decide who are the victors in the contest. There is no necessity to feel disappointed if the evidence seems to lead to results which are inconclusive. The subject is bristling with difficulties and there are decided limitations to the capacity of the human mind. Even if no decision has been reached it is hoped that this fact will not detract from the interest in the subject. Readers may feel disposed to reiterate the words of the philosopher: "there is no new thing under the sun." The problem which has been discussed in the present work is very old and also very new, and yet we do not appear to have solved it for good. It is even conceivable that it will arise in a new form in the future, perhaps not so far ahead, and philosophers, physicists, and biologists will find that the controversy centres around some new discovery which has revolutionized men's outlook on the Universe. Even then the old problem may still remain where it was—a subject susceptible to various interpretations and open to a considerable amount of speculation, but still baffling, and defying a final and conclusive solution.

When the physicist explored the mysteries of the interior of the atom there were many who believed that nearly all the secrets of nature would soon be disclosed. Although the atom seems to consist of nothing more formidable than charges of electricity, yet, in the words of Max Born, "The riddle of matter is still unsolved, but it is reduced to the problem of the ultimate particles. The solution of this problem is the task of the physics of the future." \* Even then, assuming that more light is thrown on the "ultimate particles," the particular problem which has been considered in this book may still remain unsolved. Those who have read the preceding chapters carefully

\* *The Restless Universe*, p. 277.

will agree that it is a very simple matter to obtain a one-sided view of a subject, and to think that all its difficulties will disappear if only a few fundamental assumptions are accepted. It has been pointed out that the physicist who lacks the philosophical outlook and training may prove to be an unsafe guide. It has been shown from a number of instances that the biologist is capable of deducing utterly erroneous conclusions from his experimental data. A great many of the philosophical speculations on the particular problem which has been considered in the present work are unconvincing. When the theologian enters the arena his armour proves very ineffective against modern methods of attack; and it is now impossible to hope that Revelation—a favourite armour of the past—will afford any protection in the future. As the Dean of St. Paul's reminds us: "An impassable gulf separates the modern theologian from the whole past of his science. He cannot argue as his most revered predecessors argued; their presuppositions are not his." \* It is certain that theology will have very little influence in any future discussions of the subject.

Many are perplexed regarding the important question of moral responsibility, which seems to depend to some extent on the problem of free will or determinism. Perhaps the following quotations from a very important philosophical work will be of assistance to them in their dilemma; they are taken from a recent book by Professor John Laird, and probably reflect the views of many at the present time:

"On the whole the plain statement that human beings are capable of insight into rightness, and of action in accordance with such insight, is one of the best ways of indicating the primary difference between human beings and all other natural beings that we know of. Human beings are not, of course, infallible. There is much bad reasoning, much hollow and merely ostentatious moralizing among men. That, however, is not an objection. The insight is often quite genuine, and so is its influence. When mistakes are made, they really are *mistakes* and they would be wholly impossible in a being that neither saw nor erred. . . . Personally I would go further and hold that there is no intelligible sense of moral freedom except the sense that is seldom disputed, the truism, namely, that in a certain limited class of actions we are able to decide in accordance with what we believe (and sometimes *see*) to be right, and to act accordingly. *Such* freedom does not imply that our minds are exempt from temporal causes at any time. On the contrary we usually believe that there is no such exemption. A man, we say, is not responsible, that is, cannot decide and act in the

\* *God in Christian Thought and Experience*, p. 114.



relevant moral way, if he is drugged or starved or in a fever. His lack of freedom in that case has temporal causes. Is it reasonable to account for his *lack* of freedom in this way, but to denounce that type of explanation altogether when the drug wears off, or when the man is fed or bled?

This last, however, is an interpolation of my own. Let it be forgotten if it proves to be too perplexing.” \*

This question of moral responsibility is beset with many difficulties, and even the philosopher-theologian is not always convincing when he attacks the problem. In concluding this work it may be useful to examine the views of an eminent theologian and philosopher who has dealt with the subjects of moral responsibility and freedom of the will. The survey must necessarily be brief, and it will be possible to consider only a few of the tenets of Dr. W. Temple, Archbishop of Canterbury, whose versatile mind has been responsible for a voluminous literature covering a wide range of subjects. The present writer regrets to admit that he has found him very unconvincing, not only in his method of attacking the problem which has been dealt with in the present work, but also in his discussion of other problems in some of his books which he has produced at the average rate of about one a year for more than thirty years. The criticism which follows is confined to a few of his works, and is also limited to his examination of the questions of moral responsibility and freedom of the will.

*Christian Faith and Life* appeared in 1931, and two years later it had gone through seven impressions, completing 20,000 copies. The general line of thought is similar to that which was worked out in *Christus Veritas*, published in 1924, and there was ample time for readers to point out certain apparent contradictions in some of the arguments. These seem to have been repeated, however, in *Christian Faith and Life*, and a few of them will now be examined.

On p. 16 we are told that in the choice between the ends of life we discover a sense of obligation which is absolute: “a sense of something which on every account I must do, or on no account must I do. In the reason and the conscience there is something which is demonstrably ultimate, and beyond which in principle it is not possible to go. Here we have something we may naturally expect to find akin to whatever is ultimate in the universe itself. . . . Good or bad consists in the discovery by the mind of what is akin to or alien from itself in the thing it contemplates.” From this last sentence one might naturally

\* *Theism and Cosmology*, and *Mind and Matter*. The Gifford Lectures in the University of Glasgow in 1939-40. The quotation is taken from the second series, pp. 248-50.

infer that different minds would set up different standards of goodness, and this is what actually happens, but it is difficult to see how the sense of obligation, "which is absolute," then comes in. We can let this pass, however, and consider the subject as it is dealt with more fully on pp. 62 *et seq.* Here we are told that conscience is a word used in a great variety of senses, but the usual view is accepted, that it consists of those spontaneous feelings which arise in us with regard to certain sorts of conduct. Often there is a sense of condemnation or uneasiness which comes as a kind of warning. "In a certain sense it may truly be said to be the voice of the Holy Spirit within us, but only in a certain sense." His Grace goes on to show that these spontaneous feelings are the result of moral training, most of which has been given to us simply by our sharing in the life of our country and our own section in that country, "and we have quietly adopted nearly all its standards." It would be wrong on our part, however, to follow those standards in every case, and we must criticize them and find how far we are justified in accepting them. On p. 65 we are informed that the greatest abominations in the world have come from conscience itself, such as the Inquisition, "which was at least instituted on the most profoundly conscientious grounds."

The chief comment which need be passed on all this—which, it may be added, is utterly confusing to ordinary minds—is that one must express extreme regret at the contradictions in the development of these views. There is the sense of obligation which is absolute, but it appears that it is not absolute because it is largely determined by our nationality and social status. This conscience which, in a certain sense is "the voice of the Holy Spirit within us," has been responsible for "the greatest actual abominations." Throughout the argument there is no clear line of demarcation between the functions of conscience and of the Holy Spirit, and readers are liable to gain the impression that the Holy Spirit in some way had a share in the abominations. The whole of this argument requires a considerable amount of clarifying.

Let us now turn to a more exacting work by Dr. Temple. In 1934 *Nature, Man, and God* was published. This consisted of the Gifford Lectures delivered in the University of Glasgow from 1932–4, and the problem of free will is discussed in various parts of the work. We agree with Dr. Temple in his condemnation of theologians and Christian apologists who rejoice at the discovery of supposed indeterminacy at the basis of the physical world. It is to be hoped that some of these will take very seriously his words in this connection: "That anyone should be turned from Atheism to Theism by a belief that

electrons act unaccountably seems inconceivable.” \* Although it is possible to take one’s stand with the Archbishop on this point there are many other positions adopted by him which it is difficult to accept.

In Lecture XIV, “Finitude and Evil,” we are told that “the problem of evil only exists for those who believe that the world is created and governed by God.” † It is implied that it is chiefly or entirely the theistic schemes of thought that are confronted with the “one great and apparently insoluble difficulty—the fact of evil.” ‡ A few lines later, however, we are informed that “evil is felt to be a problem even by many of those who avow no theistic faith,” and this is cited as evidence of the natural tendency of the human mind to seek some explanation of the world in terms other than those of purely efficient causation. This last admission detracts very much from the value of the view that the problem of evil only exists for those who believe that the world is created and governed by God, which was affirmed in the previous statement, but we shall not enlarge on this flagrant contradiction. It will be sufficient to consider whether there is any real connection between theistic schemes and the problem of evil.

It is generally admitted that in Hinduism the sense of sin and evil induces a pessimism which people in western countries find it difficult to comprehend. That this sense of sin is a very real thing may be inferred from the lengths to which adherents of Hinduism will go to be delivered from their sins, and it is unnecessary to dwell on this. Yet this religion includes a Pantheon of deities—it has been estimated that the number of their gods runs into millions—and many of these are local, tribal, and even connected with sects and professions. It is beside the point to argue that the Hindus’ sense of sin differs from ours and that many of the things which they consider virtuous are revolting to our consciences. Dr. Temple has admitted that conscience is largely a function of nationality and social standing. In these circumstances we must not be hasty in our judgment of people who adore the Brahmanic gods, venerate the cow, observe rules of caste in marriage and in eating food, and go to the priesthood for various forms and ceremonies connected with birth, matrimony, and death, and who also adopt numerous cruel and immoral practices in their religion. Where is the theistic scheme in the Hindu Pantheon? The same question might be asked with regard to many other ancient religious systems which had little in common with theistic schemes and which, nevertheless, inculcated the sense of sin and evil in their

\* Pp. 228–9.

† “Contents,” p. xxv.

‡ P. 356.

adherents; but this is unnecessary, and we shall now look at some of Dr. Temple's pronouncements in other parts of the work under consideration.

The question of responsibility for man's condition has been considered in different portions of the present work, and especially in Chapter IV, where we saw that Luther shrank from the view that God had predestined the reprobate to eternal loss, though Calvin adhered to this doctrine. Dr. Temple's method of dealing with the problem leaves the reader in some doubt regarding the responsible agent, and he adopts a principle of probabilities in supporting his view, as the following quotation will show:—

“Because it was not necessary that we should err, we cannot say that our sin is itself God's act; it is our fault, not His, in the first instance. But that we are finite selves is directly due to God's act, and we cannot doubt that God foresaw the issues of conferring selfhood upon finite beings, so that sin falls within His purpose, and is even part of it, though it cannot be said that He directly willed or wills it. What He faced was a probability so great as to be distinguished only in thought from certainty. ‘I speak after the manner of men.’ Of course there is, for God's *eternal* knowledge, no such thing as ‘probability’ but apprehension of all reality in its ordered completeness. Yet that distinction in thought is important. For it means that God did not directly cause any man to sin.” \*

In his Preface Dr. Temple informs the reader that all his decisive thinking goes on behind the scenes and much of it takes place on walks or during sleep. Often when teaching he has found himself expressing rooted convictions which he had not thought that he held previously, and yet they were genuinely rooted convictions. They were the response of his whole being to certain theoretical or practical propositions. Some readers may be prepared to concede that the decisive thinking which preceded the convictions expressed in the above passage took place during sleep. It makes certain *ad hoc* assumptions to support preconceived views, but it displays an inner knowledge of the working of the mind of God which is reminiscent of the mystic's visions, and which, to some men of science, must almost be suggestive of arrogance. A distinction is drawn between the eternal and temporal knowledge of God, and it is admitted that it is necessary to attribute both modes of experience and knowledge to Him. The two forms of knowledge have at least this advantage—they exonerate the Creator from the responsibility for man's fallen condition. In a subsequent Lecture, XVII,

\* *Ibid.*, pp. 369.

“The Meaning of History,” it is explained that God does not know *beforehand* exactly how human beings will respond to the various modes of His manifestation of Himself to them : “So far as He is Himself at work within the process of Time, the precise mode of the future is unknown to Him, though its general issue in the fulfilment of His purpose is secure. Yet, all the same, because He is not in His own nature within the Time-process any more than the dramatist is personally within the play, and all that happens utterly depends on Him, He knows it all with utter certainty.”

The description of metaphysics seems very appropriate at this stage : “When the audience does not know what the lecturer is talking about, and the lecturer himself does not know, that is metaphysics.”

Are we seriously to accept the view that the Creator faced certain probabilities, though for His eternal knowledge there is no such thing as probability? Can we believe that we are finite through His act, that He foresaw what the consequences of selfhood conferred upon finite beings would be, that sin falls within His purpose, and yet by an assumption on probability He is completely exonerated? Moreover, this probability was so great as to be distinguished only in thought from certainty. It may not be presumptuous to suggest that Dr. Temple might study some modern works on the theory of probabilities,\* and then, perhaps, he will “speak after the manner of men” and express himself in language which even the mathematician can understand.

Thus the philosopher-theologian, but the problem still remains unsolved, and one great obstacle to its solution must be sought in the limitations of the human mind. The words of the physicist are a very appropriate conclusion to the matter :—

“Through the victories of science, through the great theories in which we apprehend the harmony of the universe, through the development and progress of modern science, we become ever more profoundly sensible of the disparity between the wealth and abundance of reality around us and the limitation and poverty of our comprehension.” †

\* Two of the most modern works are *Theory of Probability*, 1939, by Dr. Harold Jeffreys, and *Probability and Frequency*, by Prof. H. C. Plummer.

† Leopold Infeld, *The World in Modern Science*, p. 274.

## REFERENCES

Below are some of the names of those who have associated themselves with the problem. In a few cases their writings have only a very indirect connection with the subject.

Democritus; date of birth given at dates between 490 and 460 B.C.

All are agreed that he lived to a great age.

Plato; 427-347 B.C.

Aristotle; 384-321 c. B.C.

Epicurus; 342-270 B.C.

Zeno; founded his school about the end of the fourth century B.C.

Dates of birth and death uncertain.

Lucretius; 96-55 B.C.

Seneca; A.D. 3-65

Paul; ?-A.D. 64 c.

Marcus Aurelius Antoninus; 121-80

Augustine, Bishop of Hippo; 354-430

Pelagius, dates of birth and death uncertain. His doctrine was heard of first early in the fifth century.

Thomas Aquinas; 1225 c.-1274

Luther; 1483-1546

Calvin; 1509-64

Descartes; 1596-1650

Spinoza; 1632-77

Leibnitz; 1646-1716

Anthony Collins; 1676-1729

Bishop Butler; 1692-1752

Jonathan Edwards; 1703-58

Thomas Reid; 1710-96

Hume; 1711-76

Kant; 1724-1804

Robert Owen; 1771-1858

John Stuart Mill; 1806-73

Haeckel; 1834-1919

The names of some of those who have taken part in the controversy in recent times are given below. In addition to these, the works of many of those which are given at the end of Chapter XIII have an indirect bearing on the subject.

Sir Arthur Eddington

Sir James Jeans

Bertrand Russell

Dr. C. E. M. Joad

Prof. H. Dingle

Prof. L. Susan Stebbing

## GLOSSARY

*Empiricism:* dependence for our knowledge on mere observation and experience.

*Etelechy:* a hypothetical principle endowed with purpose, which has been postulated to explain the growth of organs and the development of organisms.

*Hedonism:* the doctrine that pleasure is man's chief end.

*Limbus infantum* (or *puerorum*): in medieval theology the border of hell to which human beings who had not committed actual sin, but who were unbaptized, were consigned. Idiots, cretins, and those of a similar type, who were baptized and had committed actual sin, were also supposed to be consigned to the same place.

*Materialism:* the doctrine that all the phenomena of the universe, including mind, can be explained in terms of physico-chemical realism.

*Mechanistic theory of life:* see "materialism."

*Monads:* strictly primitive unicellular organisms, but used by Leibnitz in a metaphysical sense to denote centres of force, devoid of parts, extension, or figure.

*Monism:* the doctrine that all the phenomena of the universe are ruled by unalterable laws, and that these phenomena are due to mechanical causes, not to final causes.

*Ontological argument:* the argument used by Anselm, Archbishop of Canterbury in the eleventh century, to prove the existence of God. This argument was supposed to prove that the being than whom nothing greater could be conceived—i.e., God—must necessarily have real existence. This argument is not accepted by theologians to-day.

*Parthenogenesis:* reproduction from eggs which have not been fertilized by spermatozoa, the male element.

*Pineal gland:* a small, cone-shaped body in front of the cerebellum, which Descartes believed was the seat of the soul.

*Sheol:* the name given by the Hebrews to the place of departed spirits.

*Spontaneous generation:* the view that life arose spontaneously on the earth from dead organic matter.

*Teleology:* the doctrine that there is some final and divine purpose in the universe.

*Tropism:* the response of an organism or any part of an organism to an external stimulus.

*Vitalism:* the doctrine that postulates some special principle in living matter which is outside and independent of physico-chemical processes.

*Yēçer-ha-ra':* the evil imagination which the Rabbis believed was implanted in the soul of every individual at birth, and which was not inherited from parents.

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